Investigating Lighting in Deconstructivist Spaces

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ABSTRACT

Style of the built environment inform greatly about the character of the spaces as the environments for every moment of human life. Deconstructivism is one of these styles, which for the built environments can be said to be characterized by fragmentation, a tendency in manipulating a structure's surface, non-rectilinear shapes which appear to distort and dislocate elements of architecture such as structure and envelope. The resultant visual appearance of buildings of deconstructivist style is characterized by unpredictability and controlled chaos, in a way. Lighting, on the other hand is another very important tool in the creation of the character of spaces; whether natural or artificial. This Master thesis will concentrate on the place of lighting in the creation of characteristic implementation of deconstructivism, as a style, for buildings. Significance will be attached to the integration, design decisions and details of lighting in regards to cooperation with overall aspects of docontructivist buildings, with an emphasis on the creation of the spatial character. Due to the complex design that comes with the deconstructivist approach, delicate thought is needed to solve lighting issues for the interiors, as the irregular structuring may force lighting decisions to suit the main infrastructure of the interior itself, or, it is the lighting decisions that help highlight the ideals; and this is one of the main issues that the thesis focuses on. The main aim of the thesis is to observe and analyze how solutions for lighting effects have been incorporated within deconstructivist spaces. The main body of the research contains a literature review that focuses on the significance of lighting and the general basis of deconstructivism as a design style; the main background knowledge of the thesis is covered within the literature review that is the main support in the analysis and evaluation of the case

studies. The main method that is used within the thesis is a qualitative research, with support of visual images and known facts on deconstructivist designs and lighting solutions. The main limitation of the study is the variety and number of projects that could have been evaluated; therefore five pioneer architects of deconstructivist design have been chosen for the evaluation with their most prominent designs. Location has been another issue to avoid this issue. The building, which has received major attention of the design circles of the architects, had been chosen. The evaluations had been done through criteria based analysis, which has been derived from the literature review, on how deconstructivist spatial character had been achieved and how lighting had been integrated with the overall design of these deconstructivist buildings.

Keywords: Deconstructivist style, Interior Space, Spatial Character, Effects of Lighting, Style-Lighting Relationship.

ÖZ

Bu tez, tasarım kararlarında ve entegrasyonunda önem taşıyan aydınlatma uygulamalarına ve yapıbozumculuğa vurgu yaparken aydınlatmanın mekan tasarımında nasıl tamamlayıcı ve is birliği içinde olduğuna odaklanır. Yapıbozumcu konsept nedeniyle karmaşık bir tasarım meydana gelir, bu nedenle, iç mekanlarda aydınlatma sorunlarını çözmek için gerekli olan hassas düşünceye, düzensiz yapılanmanın iç mekanların ana alt yapısına uygunluğunu zorlayabildiğine, tez üzerinde durulmuştur. Tezin temel amacı, aydınlatma armatürlerinin ve efekt çözümlerinin yapıbozumcu mekanlar içinde nasıl kullanıldığını analiz etmek ve gözlemlemektir. Araştırmanın ana gövdesi, aydınlatmanın önemine ve yapıbozumcu tasarımın genel temeline odaklanan bir literatür taraması içeriyor. Tezin ana arka plan bilgisi ise vaka çalışmalarının değerlendirilmesi ve analiziyle desteklenen literatür ile kaplıdır. Tez içinde kullanılan ana yöntem, yapıbozumcu tasarım ve aydınlatma çözümleri üzerinde görsel imgeler ve bilinen gerçeklerle desteklenen bir nitel araştırma yöntemidir. Çalışmanın ana sınırlaması çeşitli projelerle değerlendirilmiştir; bu nedenle yapıbozumcu tasarımın beş öncü mimarinin en belirgin tasarımları, değerlendirilmesi için seçilmiştir. Yer, bu sorunu önlemek için seçilen diğer bir konuydu, dolayısıyla seçilen mimarların en ünlü binaları seçildi. Yazıda, değerlendirmeler, analiz temelli kriter yoluyla yapılmıştır ve ayrıca yazıda, aydınlatma armatürleri ve etkileri yapibozumcu binaların genel tasarımı ile nasıl entegre olabilir sorusu üzerinde durulmuştur.

Anahtar Kelimeler: Yapıbozum, İç Mekanlar, Mekansal Karakter, Aydınlatmanın Etkileri, Stil-Aydınlatma İlişkisi.

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DEDICATION

I would like to dedicate this Thesis to my Lovely Family

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Chapter 1

INTRODUCTION

This thesis will concentrate on deconstructivism and lighting implementations with a significance on the integration, of lighting designs with how to compliment and integrate within docontructivist spaces. A brief explanation of the topics that are in this thesis is discussed below.

Deconstructivism, as a style will be outlined with reference to its initial theoretical basis. Deconstructivism roots come from literary studies which made way to architectural studies. In architectural terms deconstructivism is derived from the development of postmodernist architecture that came into being in the 1980s. The main theory that influences deconstructivism comes from deconstruction, which is referred to as a semiotic analysis. The restructuring and manipulation of a structures surface or skin through fragmentation is one of its prominent characteristics, the main types of shapes used within deconstructive designs are usually non rectilinear shapes, which are distorted or dislocated from the main elements of architecture. The unpredictability and controlled chaotic design is the hallmark of deconstructivism. The final visual appearances of buildings could be characterized by the exhibit of unpredictable and chaotic structuring. (Derrida, j. 1997)

The term deconstructivism in architecture first came to be public notice in 1982, at the parc de la villette architectural design competition. The recognition of deconstructivism was realized through the specific entry of Jacques Derrida & Peter Eisenman and Bernard Tschumi, the winning entries within the competition. Other architectural competitions also helped with the spread of deconstructivist designs such as the Museum of Modern Arts 1988 deconstructivist architecture exhibition, and also the opening of the Wexner Center 1989 that was designed by Peter Eisenman (Tschumi, 1996).

Furthermore the featured works by Frank Gehry, Rem Koolhaas, Zaha Hadid, Peter Eisenman, Daniel Lebiskind at the New York exhibition. The irony behind these exhibitions is that most of the architects have distanced their association with deconstructivism. However the term has stuck and has lingered into the contemporary architecture. (Derrida, j. 1997).

The designs that were exhibited in the Parc de la Villette 1988 was regarded as a movement or a new style of architecture, Bernard Tschumi argued that these statements were not entirely correct. He believe that there was a general lack of understanding in the ideas and designs that were presented at the exhibitions, therefore they were out of context. He also states that the design ideas and projects were simply a movement that was against postmodernism, which involved the elimination of historic elements within the designs.

The main attempts that deconstructivism tries to apply is to move away from traditionalistic designs and focus more on geometric imbalances and formal experimentation. (Crouse, 2001) It is also the reverse of modernism, postmodernism,

expressionism, cubism, minimalism and contemporary art. This will be discussed in detail within the literature review. It even challenges the well know quotes of these types of styles such as, 'form follows function', 'purity of form', 'Truth of material'(Tschumi, 1996). When taking into account influence, Most of the main architects in deconstructive design were influenced by French philosopher Jacques Derrida. Other practitioner's were also influenced by Russian constructivism with its formal experimentation and geometric imbalances.

The main philosophy behind deconstructivism that is related to architectural theory was channeled by Jacques Derrida, with the contribution of Peter Eisenman. Eisenman deducted the literary movement 'deconstruction' and drew his own Philosophical bases with collaboration with Jacques Derrida directly implementing and influencing the projects including the entry for Parc de la villette competition. Eisenmann and Derrida were concerned with the term metaphysics of presence, which is directly linked to the meaning of decontructivism in the philosophy of architectural theory. They both believed that place of presence is architecture, in the same sense, in dialectic terms is presence and absence is found in construction and deconstructivism (Derrida, j. 1997).

1.1 Problem Statement

Deconstructivism in general has an certain type of design principle, it is an irregular formational type of design therefore forcing the designs to have a more complex outcome, with variation of models, shapes, sizes and material usage. One of the problems that will be addressed in this thesis is how the lighting design is integrated into these types of interiors; moreover the thesis will deal with the issues regarding

the balance of artificial lighting and natural lighting within the interiors of deconstructive designs.

With complex designs come complex decisions on the lighting designs and where the usage of natural lighting and artificial lighting will be used. This thesis will observe and concentrate on investigating lighting within the creation of deconstructivist style designs.

Lighting plays an important role within designed interiors; it is one of the elements that create the atmosphere of an interior space. A designing of a space can come through many different style/themes. Deconstructive design is a concept and style used by many architects and interior designers. Deconstructive design takes on many forms, from variations such as curved to rigid forms. It is the composition of these forms that create a deconstructive design.

The problem that will be investigated within this thesis concerns the lighting methods that are used within these types of interiors. The types of lighting fixtures/ effects that are used in deconstructive designs will be analyzed to understand how the character and creation of the space is influenced by lighting within deconstructivist interiors. Due to the reasons that deconstructive interiors tend to have expressive compositions of forms, lighting used within these types of interiors are mainly used to bring to light the design features of the interiors, the thesis will try to investigate how the lighting effects used within deconstructive interiors emphasize the essential parts of the designed space.

1.2 Aims and Objectives

The aim of this thesis is to analyze how lighting effects are used within deconstructive spaces. The thesis is formed from a literature review, bringing forward the aspects that lighting provides within interiors, the background knowledge of deconstructive design, and the consideration of lighting effects within deconstructive designs. Furthermore the thesis will try to investigate the methods of lighting, to signify the essential parts of a deconstructive interior.

Natural lighting and artificial lighting will be analyzed according to their usage, function and appropriate fixtures. What is the most dominantly used type of lamp and natural lighting openings and how these fixtures are spread among the building itself, more importantly what function or use they have within the interior. Another question that is significant is how the lighting systems and methods is integrated and complimentary towards the deconstructive design.

Examples of deconstructive interiors will be analyzed to identify the artificial lighting and natural lighting methods/effects that are present within the interiors. The analysis will be done through criteria that will be formed from the literature review; the examples will be evaluated upon the criteria to assess the most common similarities within the deconstructive interior designs.

1.3 Methodology

The research method used within this thesis will be a qualitative type of research. The thesis will contain a literature review to provide a decent background concerning the topics that will be discussed such as lighting/lighting methods/effects, spaces, styles and deconstructive design concepts. Furthermore the literature review will also

serve in providing a criteria model through the information and knowledge that will be used to analyze the examples of deconstructive interior designs.

The design style of deconstructivisim will be brought to light, through the use of interior and exterior examples of these types of buildings. The architects involved and pioneers within this field. The deconstructive design styles according to the architects will be analyzed to determine the differences in their lighting design and there integration within the design of the buildings. This information will then be used to assess the case studies that were chosen for this thesis with a focus on the natural lighting methods.

The analysis will be based on eight deconstructive designs from various architects and interior architects, the examples will contain visuals of the designs, plans, lighting plans, sections, and the general biography of the buildings. The examples will be analyzed and evaluated through the criteria that will be formed from the literature review. The conclusion will follow into determining how successful and suitable lighting effects could be used within deconstructive interiors.

1.4 Limitations

Deconstructive design concepts are used by a variety of architects/interior architects. To limit the number of examples that will take place within this thesis, four of the major architects within this field will be chosen, two projects for each architect will be chosen the choices will be based on the quality and standard presenting the deconstructive style. This will limit the amount of projects that will be analyzed.

The buildings that have been analyzed within the examples are not physically visited, rather observed through visual examples. This is due to many of the deconstructive

designs are located in different parts of the world. Location would have been an issue with this limitation there is an advantage of analyzing more buildings through visual examples.

Another limitation that is implemented is the focus of lighting and lighting effects, the analysis will be based around the lighting effects/methods that are used within these types of interiors; there will not be a comparison between the interior examples. The analysis will try to observe the reasoning behind the principle of deconstructivism and how lighting plays a role within the creation of space.

Chapter 2

DECONSTRUCTIVISM AS A STYLE OF THE LATE 20TH CENTURY

2.1 Origins of Deconstructivism

Stimulating its existence from the deconstruction theory, which formed by semiotic analysis; deconstructivism is distinguished through the formation of aspects based on fragmentation, with a significance on manipulative structuring and skins for exteriors In relation to interiors. Though post modernizm and the growing number of decontructivist architects published opposing theories beside each other. Although postmodernism seizes its restoration, frequently with timidity or arrogance of its historical references, deconstructivism repudiates acceptance of postmodernism and its references (Derrida, j. 1997).

Deconstructivism and the rationality of modernisim is in conflict with the contemporary architectural scene modernism; conjointly having distinctive contradiction with its relation to postmodernism. Though post-modernist and incipient deconstructivist architects distributed theories beside one another in the journals contented, this imprints a beginning of crucial break between the two movements. (Michael, 2000)

The deconstructivist theory emerged from postmodernism that established in the late 1980's. It has been developed by the deconstruction theory, which is formed through

semiotic analysis. The design of buildings illustrated through fragmented ideas and maneuver of the general exterior facades/surface or the skin, this is characterized be the deformation and dislocation concepts of architecture, with extensive use of non rectilinear shapes. The general visual aesthetics of deconstructive buildings can be identifiable through their finished visual appearances that reflect an unpredictable and controlled chaotic view. (Michael, 2000)

The postmodern art began in the late 1980's where the idea of radical freedom and unconventional designs were inaugurated and encouraged, so the construction of fragmented and distorted designs emerged. Deconstructivism is perhaps noticed and recognized mostly through architecture. One of the most recognizable styles of deconstructivism concept is seen at the museum located in Bilbao, Spain called Guggenheim Museum. However deconstructivism is not only used to identify architecture but also used to categorize graphic design, fashion and products. (Michael, 2000)

This thesis exploits the history of Deconstructivism, the several concepts and the artists which have contributed to the development and its utilization in graphic design.

"Deconstructing is to deform a rationally structured space so that the elements within that space are forced into new relationships. Deconstructivism is a combination of cropping, layering and fragmenting (Samara,2002). The deconstructivist architects were primarily influenced by the ideas of Jacques Derrida, the French philosopher. Derrida's work of deconstruction argues that deconstruction

> "Is not a style or 'attitude' but rather a mode of questioning through and about the technologies, formal devices, social institutions, and founding metaphors of representation" (Typotheque).

The concept is very much history as well as theory. (Samara,2002)

Derrida launches the presence of deconstructivisim within the book Of Grammatology. The theory lies on the consent that permits questioning of how reality is represented. Derrida and deconstructivism emerged to his attention through his interest in radical formations, significance of manipulation. 1970s architects that followed the deconstructive trend desired to break away from the classical order and space concept, also from the idealistic ways of the modern movement.

The main idea of the deconstructive trend was solely to distant itself from the classic restricted rules of modernism. With the main idea being purity of form and the other classic definition form follows function. The "purity of form" surfaced through another art form, from a French painter named Amedee Ozenfant which referred to "Purism" a form of Cubism. The artists that designed under purism made sure that their geometric form was precise and in a manner of proportion that was pure (Padilla,2009).The initial purpose of "form follows function" is a self explanatory principle; the concept is that the shape and form of the building or architecture should be intact and relevant to the function that it is intended for. The principle of deconstructivism was primarily to oppose the rules and regulations of modernism and rationality. (Padilla,2009).

The event that distinguished the existence and acceptance as well as impacting the

awareness of the deconstructivist movement was the exhibition held at Museum of Modern Art which was entitled; Deconstructivist Architecture 1988. The within the architects that exhibited their works were Peter Eisenman, Frank Gehry and Bernard Tschumi. Derrida was a major influence on Eisenman and they collaborated on projects. Both Derrida and Eisenman were interested in the primary idea and aspects of deconstructivist philosophy (in terms of architecture) which is the concept of the "metaphysics of presence".

Frank Gehry one of the prominent architects in the field is known for his projects such as Guggenheim Museum in Bilbao, Spain as well as the Weisman Museum of Art in Minneapolis, Minnesota and is an award winning architect. Tsuchumi was an architect who won the entry for the Parc de la Villete Competition in Paris gathered to a great extent, attention and merriment. Philip Johnson and Mark Wrigley, the launchers of the 1988 MOMA exhibition stated that,

> "The projects in this exhibition mark a different sensibility, one in which the dream of pure form has been disturbed. It is the ability to disturb our thinking about form that makes these projects deconstructive" (Johnson,1988)

Late 20th century tendencies are known to have some similarities to Russian constructivism in terms of architecture, designs such as diagonal overlapping of rectangular or similar shapes and the use of warped planes. Comparable with the works of Lissitzky, Malevich and Tatlin, although several critics have denied having similarities and the associations are only hesitant in the case of some declared to be deconstructivist (Oxford dictionary of architecture and landscaping, 2006). Deconstructivist architecture has been inclined with the works of Eisenman, Coop

Himmelblau, Gehry, Hadid, Koolhaas, Libeskind and Tschumi (Oxford dictionary of architecture and landscaping, 2006).

Deconstructivism creates the sense of dislocation to the building as well as the exterior environment, creating conflict between the forms and the context. By fragmenting continuity, disconcerting the interior and exterior, fracturing connections between exterior and context, Deconstructivism contradicts the conventional notions of stability, harmony and unity (Oxford dictionary of architecture and landscaping, 2006).

However deconstructivism cannot be considered as a new movement nor as a consistent stylistic development according to independent architects: it exposes the unusual and discomforting in terms of deformity, distortion, fragmenting and the discomfited superimposition of grating , disparate grids. Taking Russian Constructivism as a starting point, deconstructivism was linked to the philosophy and theories of Derrida (1930-2004), and assuming that architecture is a language; it has the ability to communicate meaning and receive conduct through methods of linguistic philosophy: certain difficulties arose, as it is arguable whether late C20 and early C21 architecture acquires any claims to a vocabulary, not that it can have any relevance to language.

Nonetheless, some architects for example Jencks have defined deconstructivism as a new form, however others have questioned following this, bearing in mind of the impact and outcomes it is having on the evident buildings and environments, considering the effects it will have on the future generations architects: those who

contradict the continuing of deconstructivism has interpreted the mindset that the concept is destructive, due to the fact that it declines all of what was and its unsuccessfulness to offer valuable replacements. Deconstructivism has indeed been perceived as deliberate aggression on human senses, purposely fragmenting mechanisms to form anxiety and discomfort. If deconstructivism is a new form, this could lead to deeper concerns. (Jacques, 1998)

2.2 Philosophy of Deconstructivism

Several deconstructivist architects were inspired by Derrida, the French philosopher. Derrida and Eisenman were friends; however his approach to formations linked to deconstructivism developed before he became a deconstructivist. According to him, deconstructivism should be characterized by the deformation and radical formalization. The Russian constructivism due to its formal experimentation and geometric imbalance has also had influence on the practitioners of deconstructivism. Deconstructivism endeavors to break away from conventional and restrictive "rules" of modernism/postmodernism which articulates expressionism, cubism, minimalism and contemporary art, moving away from forms such as "form follows functions" "purity of form" and finally "truth to materials".

With the influence of the philosopher Jacques Derrida, deconstructivism became an architectural theory through Eisenman. Eisenman applied philosophical foundation from the movement of literary deconstruction; joint efforts were made with Derrida on projects including an entry to the Parc de la Villette competition. Derrida, Eisenman and Daniel Libeskind were interested in the main subject of deconstructivism; the importance of "metaphysics of presence" in architectural theory. This is the assumption that architecture is similar to language and can

communicate and receive treatment through methods of linguistics. In various projects of Eisenman the occurrence of dialectic presence or absence, solid or voidance is seen both built and un-built. Derrida and Eisenman consider place of presence as architecture, and the same priorities are found in construction and deconstructivism.

By working with classical narrative structures, allocates the best reading of the text, according to Derrida. An architectural deconstructivism must have a reinforced conventional expectation in order to create its conflict; it requires a classical structure or construction to make evident the opposition. The Santa Monica residence designed by Frank Gehry (from 1978) has been noted to be a classical deconstructivist building. Frank Gehry's break through was with the design of a suburban house representing typical and intended social meanings. Gehry's designs were playful subversions, altering massing, spatial envelopes and planes which was an act of "de"construction" (Andrew, 2010).

The notions of Derrida in terms of trace and erasure was additional to his concept of metaphysics of presence and deconstructivism. The philosophy of Derrida and the style of literature and classical writing was the link that made way to the deconstructivist memorial (Derrida, 1998). Daniel Libeskind wrote discourses on criting in the forms of his early projects which is often related to forms of concrete poetry. His main concepts behind his architectural designs are related in a way with his writing sculpturing made from books and coated modals can be seen within his example for his conceptual idea. Libeskind applied Derrida's notions of trace and erasure in his essays and in his project for the Jewish Museum Berlin. Intentionally,

it was designed to be comprehensible and poignant to make the museum a piece of the happenings throughout the Holocaust.

Memorials for example Maya Lin's Vietnam Veterans Memorial or Peter Eisenman's Memorial to the Murdered Jews of Europe are known to reflect traces and erasure. Through a number of the architectural conferences held at Tate in London and at MOMA in New York in 1988, deconstruction and design combined to generate deconstructive concepts. Many of the successful contemporary architects of the 1980s such as Peter Eisenman, Frank Gehry, Zaha Hadid, Coop Himmelblau, Ren Koolhaas, Daniel Libeskind and Bernard Tschumi all had a place within these events. The major collection that followed the events of deconstruction, Andreas Papidakis (1989) states

> "Few ideas in architecture have created such a stir as Deconstruction in the relatively short time since it gained currency and public prominence"

The influence can be seen in contemporary day architecture, within the review of salinargos, 'Anti-Architecture and deconstruction'. Mier (2005) states,

> "Deconstruction is an architectural style that in recent years has gained ever-increasing influence among architects and educators, as well as decision and policy makers and developers of prestige projects".

There was a sense that deconstructivism opposed influences towards general designs and architectural sculpturing, Mier continues to state,

> "Architects cannot go on indulging themselves in the misty atmosphere of 'constructive ambiguity', with the logic of cults, the rhetoric of twisted pseudo-philosophy phy, and the terminology of disciplines they have no understanding of. It is time for architects to realize that an

> aggressive, self-propelling group has hijacked architecture, its teaching, discussion and raison d'être This de-hierarcized, flexible, context dependent approach originated in earlier projects and as Tschumi claims, 'the first deconstruction superposition work was my Manhattan transcripts" (Andrew, 2010).

Deconstruction originated in France in the late 1960's as a practice of philosophy. Attributed to the philosopher Jacques Derrida, deconstruction analyzes the relationship between nature and reality in conjunction with mind and matter, upending the Western metaphysical tradition. Also known as post-structuralism, it is opposing the thought of the notion of reasoning within design and independence as human entities. Being treated as a fuse of social and linguistic compounds, hence referred to as being "constructed" (Barry, 1993). The response related to the diversity of theoretical and philosophical movements of the 20th century, deconstruction is mostly noted by Husslerian phenomenology, Sausserean and French structuralism as well as Freudian and Lacanian psychoanalysis. "Deconstruction" originates its terminology through the German philosopher Martin Heidegger's Destruktion and Abbau. The major establishments that Heidegger generated resulted in the development of structuralism thinkers such as Derrida. For Derrida a literal translation of terms are what is translated into architecture. According to Derrida, the meaning of deconstruction is,

> "Not destruction but precisely a destructuring that dismantles the structural layers in the system"

And Abbau means,

> "To take apart an edifice in order to see how it is constituted or deconstituted". (Barry,1995)

The theory of deconstructivism is applied in literature, it is one of the methods used to criticize and analyzing in the manner of inquisition. For Derrida, for deconstructive reading: should always intend to focus on a firm relationship, the writer should write between what he commands and doesn't according to the pattern of the style of language used, to make messages unperceivable, perceived to be more understandable.(Rago, 2004)

Gathering is foundation from the literary movement of deconstruction; it is a recent practice of though for architecture; generating its name and inspiration from the Russian Constructivism movement in 1920's. Countering the rationality of Modern architecture, deconstruction is a contemporary style. Deconstruction theory issues the conventional patterns of interpreting form and space.

Designing disconnected, non-linear, fragmented or structurally imbalanced outlines that are perceived to be incomplete formations are of significance in this theory. Architecture that resembles these styles can be characterized by the unpredictability and view of controlled chaos. The influences of the modernists of the 1920 and the art of the Russian constructivists are seen in the deconstructivist architects of the 1980s and 1990s. The architects of deconstructivism gained worldwide reputation through the exhibition named "Deconstructivisit Architecture". which was held at the Museum of Modern Art in 1988, one of the organizers of the event was Philip Johnson and Mark Wigley. The exhibition visually expresses many of the biggest contributors to the development of the style, artists such as; Frank Gehry, architectural projects of Peter Eisenman, Coop Himmelbau and Bernhard Tschimi.

This exhibition was the influence that made way to the movement of the deconstructivist style that opposed solidarity and formal compositions that were cohesive the gain sufficient results of deconstructivist styles architects must question the foundation of construction and tectonics, and formalities/regulations of architecture. (Wigley,1993). Through questioning the thought of building, results in involuntary questioning of tradition. Additional to this the questioning of "institutional authority" arises; relating back to the philosopher architectonics, and so on…" (Wigley,1993). Through questioning the thought of building, results in involuntary questioning of tradition. Additional to this the questioning of "institutional authority" arises; relating back to the philosopher Derrida and his point of view on notion of "centre". "Centre" or "institutional authority is known to represent the foundation of the Western thought the "episteme". The dominating characteristic of deconstructivism is to "decenter" the architecture from the imposed system. It is aspirated to section away from the current "episteme" that devours us. Architecture and its essential elements have been agitated during the process of breaking away from political, traditional thinking and its relations. Deconstructivist architecture are often interpreted as having no visual logic or coherence appearing to be disturbed, fragmented and disharmonious (Rago6forms).

However the buildings reveal cohesion according to the principles of deconstruction. Derrida appoints the question that is evident in every aspect of his theory; what gives reason for distinction between interior and exterior, comprehensible and physical, speech and writing? The ambition of deconstructivist architecture is to defect the concept of conventional buildings by exposing a difference between its exterior and

interior, generating diverse accommodations to space, reprocess the ideology of its enclosure and force diverse means of access. (Wigley 1993)

2.2.1 Deconstructivism Theories

Deconstructivist theories can be associated with literature; some of its meaning is conveyed through the breakdown of the literature concept of deconstructivism. This could be identified and defined by, the philosophical movement in the theory of literature criticism, the meaning is related with the traditional questions and accusations regarding certainty such as identity and truth, it relay's the message that words can only relate to other words, but the true demonstration is how any text could be subverted from their own meaning. This could be made clearer with a quote, (Farlex Dictionary, 2014)

> "In deconstruction, the critic claims there is no meaning to be found in the actual text, but only in the various, often mutually irreconcilable, 'virtual texts' constructed by readers in their search for meaning" (Rebecca Goldstein, 2000).

Terms such as Literary & Literary Critical, is a technique which in literary analysis the meaning of a word is different from the meaning it conveys when taking into consideration of the reference for the thing that it stands for. For example different meanings could be deciphered when you take apart the structure of the sentence and language that is used to assume a point, the fixed reference point within the words are actually beyond themselves (Farlex Dictionary, 2014).

There are two theories regarding the literary deconstructivist theory,

1. The theory is in textual analysis where a text has a different meaning and has no stable point/reference; questioning assumptions that represent reality within the ability of the language.
2. The theory started as a philosophical and critical movement within France 1960.

(Farlex Dictionary, 2014).

Jacques Derrida inspired this theory mainly from her work regarding the method of philosophy and literary analysis. This method challenged the fundamental conceptual distinctions or oppositions. (Webster, 2013)

What has been covered above is the literary understanding of deconstructivism, the relation of the concept that was brought to light by Derrida was introduced to architecture through a collaboration with architect Peter Eisenman. It is now important to note what and how this theory was applied in architectural terms. (Webster, 2013)

2.2.2 Decontructivism in Architecture

Demolition or dissimulation is not the meaning in deconstruction, deconstructivism diagnoses problems with the stable structuring of a building but it does not lead the structure to collapse. On the contrary deconstructivism strives and gains its force from the visual distortions that is presented upon a structure, it challenges the design values and principles of harmony, unity, stability, similarity. The flaws of a structure are the main fuel point of getting across the stylistic features of deconstructivism (Jencks & Kopf, 2005)

As a practitioner architect of deconstructivism one is not who dismantles buildings, on the contrary it is one that fathoms the essence of the disabilities and dilemmas within a structures interior or exterior. A deconstructivist architect puts aside old forms of thought when it comes to the pureness or traditional styles of structure and tries to identify the repressing features within the pureness; expressing these deformations of impurity. With the identification of impurity it is then brought to the surface as a visual interrogation to the pureness (Jencks & Kropf, 2005).

Irregular forms could be understood, within the chaos of deconstructivist interiors or exteriors, although it is perceived as a structural condition rather than a dynamic visual aesthetic. The pureness of the form is distorted with the formations of irregular geometric approaches. The traditional condition of the architectural structure is disturbed in this manner. (Jencks & Kropf, 2005)

2.2.3 The Other Movement Towards Deconstructivism

The movements that led to the inspiration of deconstructive design should be brought to light to understand how this type of style took place and came to public notice; the main points in how deconstructivist design came to be will be explored by the progression of styles and ultimately the emergence of deconstructivism. (Norris, 1988)

2.2.3.1 Post-modernism, Russian constructivism, Modernism

First of all let us identify what post modernism is and how the forms of post modernistic style represent, the post modernistic style was a reaction against modernism in a way of bringing back cultural and historical elements to the designs of structures in an exaggerated manner. It was mainly a reconnection to the past expressed through the modernistic approach. It arose when ethnic groups refused to

blend into the modernistic style with the renewal of standard architecture. Although it was not entirely fixed to the past, strict imitations were regarded as unpopular. (Agger, 1991)

Most theorists regarded the movement as double coding, meaning that post modernist architects reflected past elements of architecture with a conscious self transformed forms of the elements, exaggerated, distorted, and was deliberately made to stand out in irony. The main idea behind the architects is more exemplified with the thought of; ‘yes I am using an arch, but this arch is my own modern design of the arch’, therefore technically it is not historic. One of the major aims of post modernism was to connect with the public directly through the use of historic, ethnic and traditional structuring. Post modernism brought together both modernism and the historic ties of the past, it is a style that both relates with the public and does not cause distress with the sterile form of modernism (Agger, 1991).

2.2.3.1 Deconstructivism as a Response to Post-modernism

Post modernism lasted up until 1990 by this time it was practices extensively, one of the next styles to emerge was the mediagenic movement called deconstructivism. One of its slogans was ‘form follows fantasy. The main theory and formal compositions of deconstructive design is already covered extensively above, as discussed above it emerged with the literary theories that was brought to light by Jacques Derrida. The crooked walls, asymmetric geometry, leaning columns, projecting formations from the main structure, is the character and style that is identifiable with deconstructive designs ("Contemporary architecture," 2004).

Deconstruction holds within its nature that there is no fixed point (accessible truth), It is a bliss with its chaos and multiple points of interpretations. The spin off from deconstructive architecture displays chaotic & dizzy designs with diverse Perspectives, confusion and vertigo are the main aspects and desired effects with deconstructive design. The main architects within the field of deconstructivism with their works are Zaha Hadid, Peter Eisenman, Rem Koolhaas, and Denial Libeskind as well as Coop Himmelblau with his punk designs of Viennese firm. (Postmodernism to deconstructivism pdf)Disturbed perfection and symbolized elements that are randomly formed bent or trumbling are the representation of the decon style of formations. It is fragmented forms uncertainty of contemporary styles of living, after the collapse of the Soviet Union and the berlin wall 1987 stock markets. (Soesilo, 2003)

2.2.3.2 Deconstructive Design and Beyond, New Formalism Within Architecture

With the improvements of computer aided design contemporary architecture is freed to use complex curves, it encouraged architects to be more imaginative in designing complex shapes modules to suit contexts rather than the straight forward cubistic designs. It led the way for sculptural architects to fathom the notion of new formalistic design approaches. Another advantage that computer aided design brought to light was the detail in plans and designs, this also applied for complex unconventional geometric formations ("Contemporary architecture," 2004).

2.3 The Place of Lighting in the Deconstructive Buildings

Lighting has a very important meaning within everyday life, it is the life force that enables us to perceive the physical space that we accompany, to talk about lighting within deconstructive interiors, it would need a broader understanding of how lighting actually works, and how it affects every type of space. With modern lighting

techniques more can be achieved with the style and effect that is desired for any given space. Human Beings in general utilize lighting in every aspect of daily life. Lighting is separated into two main categories natural lighting and artificial lighting. Especially when it is related to deconstructive designs, with deconstructive designs being complex in nature lighting decisions must meet the general standard of the design that is presented. Within such building spaces, the fundamentals of lighting have to be discussed, along with lighting effects and the types of lighting methods and implementations.

The main issues of discussion will be regarding the balance of natural lighting and artificial lighting is implemented within deconstructive designs. Firstly the basics of lighting must be covered to have the scientific knowledge base, that can support in the understanding the analysis methods that are going to be used.

Visual information is solely linked to lighting; Gibson (1979) suggested that the process of discriminating information from our visual cortex is specifically related to our perception of light and how it reflects off of objects. He also suggests that the base meaning of light is differentiated within the specific science that it is used both verbally or written. There are two types of concepts regarding the scientific side of light. The first being the science of light that is in general regarded as optics, the other being the science of vision, both of these sciences refer to optics. He argues that these two sciences are in separable from each other. Gibson also suggests that the way in which these scientific aspects of light could be separated is that light is a physical energy, and he separates these two concepts are light as a stimulus for vision and light as an information system for the perception of physical environments.

2.3.1 Lighting According to Source

The visual system works in many ways Altkinson & Hilgard discusses that visual perception is essential in perceiving the physical realm they also suggest that visual perception is only one of the ways that we perceive our environment, with our other sensory systems allowing us to gain the essences of the spaces that we are in, allowing us to gain additional information. (Atkinson, R & Hilgard, E. 2000)

Lighting brings about functionality within a space, it is the fundamental basics of human beings, and this is thoroughly discussed in William Lams Book *Perception & Lighting as form givers of architecture*. Lam (1992) Discusses that the visual information that is gained through the visual environment is solely related with light, it provides the objectivity and brings forward the functionality of a space or any given environment.

The inhabitance of a space initially needs to be illuminated so that it could be functional, with a well-lit environment humans gain the ability to do what is needed to be done and feel good while in the process. This explanation is a simplistic expression of what lighting could provide for us. It also summarizes the main aspects of lighting and design; it is to provide the necessity of a pleasant, comfortable, safe, functional and interesting environment to whoever inhabits the space. (Lam, 1992) Every type of environment that is generated could be used for differentiating human activities. To make these activities successful and functional a certain degree of visual information is needed so that the tasks that are to be performed in the space could be processed. For example reading a book at night requires artificial lighting to interpret the visual information from the pages, with the right lighting of specific tasks, brings about ease in the functionality of the space.

Before the invention of artificial lighting, for thousands of years human beings have reliant on the natural light source, ‘sunlight’ the natural source of light in the day time, and the moon in the nighttime, the natural sources of light for earth. (Lam, 1992).

The most specific factors in the impacts that you could create within a space comes from lighting, it is one of the most fundamental needs within interiors spaces mostly, without lighting nothing could be perceived or functionally operated. It is important to note that spaces that have a lack of lighting could affect the way in which we feel about the space, therefore lighting does not only affect the way in which we perceive the space; it also effects the emotional state through our perception. Light levels and luminosity in general is closely related to visual perception. (Lam &Ripman, 1992).

The basics of lighting have been covered through a filter of what lighting provides to humans, at this point it is important to discuss what lighting can provide as a designing tool with a brief overview of artificial lighting and its uses and the balance between natural lighting and Artificial. Lighting as a tool for design could provide the aesthetical accenting of certain objects within designed interiors or exteriors, it can also define the boundaries and limits within a space, it could be used to define certain points of interest or general task lighting that is required for the space. It can also bring to light the attributes and characteristics of a space; it is all dependent on the light levels that are used for certain aspects of the interior. Exterior (Lam &Ripman, 1992).

As discussed above lighting comes in two forms natural lighting and artificial lighting.

The delivers natural lighting and artificial lighting is manmade, it is powered through electricity with the use of various lamps, the only difference between the two beings that artificial lighting consumes natural resources so that it could be provided. The preference of both of these sources rely on the time of day, it is usually accepted that the use of artificial lighting should be used if a space is prone to no natural lighting. During daytime hours it is important to gather as much natural lighting as needed for an interior space, rather than the usage of artificial lighting, this could be achieved through the use of openings such as windows, roof lighting and other openings as such. Artificial lighting is mostly used when natural lighting is absent within a space (Loe &Tregenza, 1998).

2.3.1.1 Natural Lighting

Natural lighting is not only resource free but it is also a biological need for humans, it is also a form of heat, visual informative source, it also indicates weather patterns, which leads to the choice of clothing, our choices of building directions, therefore it is a significant factor that affects our everyday life consciously/unconsciously. Direct sunlight could sometimes be distressing due to heat factors or glare to the eyes; generally different types of shades are used to cover this issue. (Lam, 1992).

Natural lighting is preferred in interiors if it does not directly interfere with activities within the space. As an example, if there is direct sunlight on a work desk it could cause problems and irritation for the occupants, this could be avoided by using different techniques in shading to find the right amount of natural lighting that is needed within an interior. If there is excessive sunlight entering the interior, it could cause a lack of motivation and stress for the occupant. (Lam, 1992).

By designing the right type of window openings, with shades, blinds, curtains, and other forms of shading, could help with controlling the amount of natural light that enters into a space. The amount of glass used for the window openings also affect the light that enters into a building, with new technologies glass can now filter the amount of light that penetrates the glass, this technique is called fritting. The coating of the glass can be modified to get the right amount of light filtering that is needed for specific interiors. As an addition the positioning of the windows and openings according to sunset and sunrise affects the lighting quality of a building dramatically. (Grimley, & love, 2007).

The balance of artificial and natural lighting is brought down to the designer choice within a space, picture a scenario where there is a dominance of natural light that is creating unwanted contrasts and creating distressing shadows in spaces that need to be lit. This can be avoided by the implementation of artificial lighting fixtures that are carefully placed to diffuse the unwanted contrasts and shadows, by the implementation of both natural lighting and artificial lighting balance can be achieve. (Grimley, & love, 2007).

The openings of buildings have significance in the general design of structures. The functions of daylighting could be classified by the penetration of light, air circulation and the view it generates, in addition to the general articulation in relation to its interior and exterior (Tevfikler, 2002). One of the most important design elements within an interior space is openings, aside from the daylight penetration, the function and characteristic value it adds to the interior is influential (Tevfikler, 2002).

Positioning openings on vertical planes is the general option that we see within most designs; however opening could be used on a variety of surfaces. Architects can utilise other boundary elements for openings such as, ceilings, roofs or any defining boundaries. In addition to the variety of choice with openings, shape, size, and colour of openings could be modified to suit the general aesthetics of a facade or interior effect.

There are certain aspects of day lighting which can be utilized in the formation of spaces. The ways in which light could emphasize the expression and character that a space is intended for. It can be used to define the boundaries between exterior and interior, enclosures, emphasizing movement and circulation patterns. Lighting that is design with purpose in bringing together the spatial definition, form and space, make way for rich lighting effects (Tevfikler, 2002).

2.3.1.2 Artificial Lighting

The influence and impact of artificial lighting within a space, could not go unnoticed when trying to set a certain mood or effect relative to the interior style and characteristics, artificial lighting is sometimes necessary to set an atmosphere that could be altered with ease to suit the right amount of light levels within a space. This could be achieved by the careful planning and variation of lighting fixtures. (Grimley, & love, 2007).

When it comes to artificial light sources it is regarded as a specific light sources meaning that different types of fixtures/lamps could be used for different types of occasions/interiors/designs. As an example bedside lamps could be useful in providing just the right amount of light needed to read, where as having the general lighting will be to extensive for reading a book. Another example could be mood

setting in restaurants having an ambient lighting, to make customers feel more relaxed and comfortable. This is the reason why artificial lighting is regarded to be a specific type of lighting that can be chosen to suit any type of space or activity. (Grimley, & love, 2007)

Now that we have covered the general aspects of natural and artificial lighting it is important to relate this information with deconstructivist designs. The lighting designs within deconstructive design will be discussed with the theoretical perspective to try to understand how lighting effects are used within decon interiors and exteriors.

2.3.1.3 Developing Evaluation Criteria According to Source

Source of lighting is one of the major evaluation criteria that is used within this thesis the interiors that will be examined within the case study examples is followed with what type of sources are dominantly used, and if used how and what effects it provides for the interior spaces of the examples. This has provided the right information needed to make observations with the support of scientific knowledge on how these sources operate.

2.3.2 Integration of Lighting within Architectural Design

The basic scientific knowledge on lighting has been cover, it is now important to note the types of lighting methods that give character to interiors and exteriors; the combination of these methods is what provides the essences within impressive interiors. the methods that will be covered are ambient, focal, accent, task methods, it is essential to have an awareness of how lighting effects could change the general aura of an interior or exterior, furthermore this knowledge will be used to create the criteria module that will be used in evaluating the case studies chosen for analysis.

The lighting methods that will be discussed will have visual examples to support the information that will be provided. Each method will have a visual example; these examples will be discussed through the filter of how the lighting affects spaces and what the certain methods can provide within a space whether it is aesthetical or mandatory general lighting

2.3.2.1 Ambient

Figure 1. Ambient lighting 1 (URL 1)

Figure 2. Ambient lighting 2 (URL 2)

Ambient lighting is one of the most used lighting methods is an all-purpose lighting method; ambient lighting provides a set of advantages for an interior/exterior. It is mostly regarded as an all-purpose lighting method, the light source coming from different fixtures at different levels of lighting to create the ambiance according to the needs of a space and the function of the space. Ambient lighting could be adjusted to suit the right lighting level for any given time of the day; it can also be used to balance the level of natural lighting that enters into the building consequently eliminating unwanted shadows. (Grimley,& love 2007)

As seen in figures (1 & 2) different lighting fixtures around the interior at different levels create the certain ambience for the space. To give ambience to a space the preformed function must be taken into consideration, this is important in concluding the right type of lamp and color of light that will be suitable for the space to create the right ambience.

2.3.2.2 Accent

Figure 3. Accent Lighting 1 (URL 3)

Figure 4. Accent lighting 2 (URL 4)

Spot lights and other strategically placed lighting fixtures can be used to create accents within a space, this type of lighting method is generally used to provide a certain aesthetic for a space, it could also have different uses such as a highlighting method to create boundaries or bring forward a certain piece of art work or ornament of interest, highlighting design details within a space it also helps with the general ambience within a space. Accent lights are generally low voltage fixtures that could be easily modified to provide the certain effect (Grimley,& love 2007).

The general idea behind accent lighting could be seen in figure (3) the lighting fixtures used is spot lighting fixed in a way that the lamps could not been seen, there

is actually type types of lighting methods used for this figure, down lighting and wall washing, which will be covered later in this study. The spots highlight the texturized wall creating an interesting wall texture that is signified with the lighting used. Figure (4) is showing an example of ceiling accents adding to the aesthetics of the space.

2.3.2.3 Focal

Figure 5. Focal Lighting 1 (URL 5)

Figure 6. Focal lighting 2 (URL 6)

Focal lighting is most referred to as lighting fixtures such as chandeliers, however focal lighting could come in many different forms and concepts, large openings within interiors can be a focal natural source of lighting, firstly focal lighting method is defined as a lighting fixture that is staged to be the main source of lighting and the highlight the main space of and interior or exterior, it is a dominant source of lighting. The focal glow of an interior is termed the focal lighting method of a space. The most successful lighting designs are based around the focal glow and the general ambient lighting of the interior along with the balance of light levels within the space (Grimley,& love 2007).

Figure (5) shows an example where natural lighting provides the focal glow within the interior of this science museum/activity center the opening in the ceiling provides an extensive natural light source and focal glow. Figure (6) shows an importance to the entrance of a building, it has no focal glow however the dominant light source within the entrance creates a focal and interest point in the design of the building.

2.3.2.4 Task Lighting

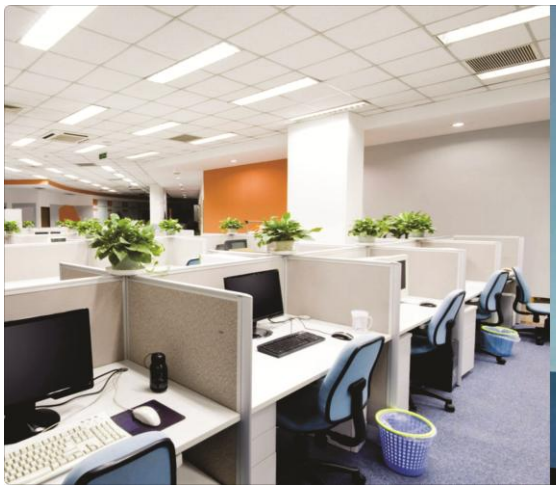


Figure 7. Task Lighting 1 (URL 7)

Figure 8. Task Lighting 2 (URL 8)

Task lighting has a specific function as a lighting method in comparison the other methods, task lighting as the name suggests is to provide lighting for activities that need more illumination to function. Offices are a good example for task lighting other than the general lighting of a space; task lighting provides the necessity of illuminating the space that is to be worked in. General Task lighting fixtures are Table lamps for desktops, bedside lamps, and other installments, task lighting is applied when there is a need for extra lighting (Grimley,& love 2007).

Figure (7) is a classic office space interior the general lighting is provided by fluorescent grid lights, but generally every desk is provided with a desk lamp to

provide the extra task lighting if needed. Figure (8) illustrates task lighting fixtures these are generally free standing units which can be modified to suit the function. Task lighting is mostly used in spaces that require more light to perform more precision.

2.3.2.5 Developing an Evaluation Criteria According to Lighting Design

These four types of lighting integration methods are the criteria that are used in the evaluation of the case study examples. Moreover the integration of each lighting design will be brought forward within the evaluation. These four methods are used to determine the types that were used within each interior.

2.3.3 Methods of Lighting

There are type types of lighting methods that will be discussed, up lighting and down lighting. Each has their own style of lighting interiors. Visual examples will show how up lighting and down lighting work within interior spaces, alongside the effects that are added to the interiors general design and aesthetics. Wall washing is generally familiarized with these types of lighting methods it is sometimes the reason for the effect seen within the interior space. These two lighting methods is discussed in detail below.

2.3.3.1 Up-Lighting

Figure 9. Up lighting (URL 9)

Up lighting is one method to use to add aesthetics within a space in figure (9) it is seen how up lighting could effect on how the light reflects of surfaces and creates a unique effect. To gain successful results with up lighting the height of the ceiling should be considered, if the ceiling is short than the chances are that the light will bounce of off the ceiling, this could also be controlled be the way the lighting fixture is placed adjusting angles could shorten the length of the given light. Figure (9) illustrates that the ceiling is short and the light is reflected of the ceiling adding a certain aesthetic. Another way to get successful results with up lighting is the significance of hiding luminaries so that there is no initial glare from the lamp this also helps with the general illumination of the interior and creates a certain ambience. (Mclean, P, 2004). The disadvantages of up lighting is that it is energy consuming due to the light absorption from the ceiling, however it is an essential part to creating the right lighting effect that is needed for the interior. (Mclean, P, 2004).

Figure 10. Combination of up and down Lighting (URL 10)

2.3.3.2 Down- Lighting

Figure (10) illustrates luminaries witch function as both down and up lighting, the down lighting is controlled distribution of light whereas the upward distribution is wider in scale. One of the advantages that these lighting fixtures have is that it provides direct lighting on task areas and a boost to the illumination of the general space; it also reduces the glare from normal ceiling fixtures (Mclean, P, 2004). Having both of the effects fixed in different areas of the interior can boost the aesthetical value and light levels. These types of lighting methods provide and aspect called wall washes where certain parts of the wall can be brought forward by these types of lighting fixtures, they play an essential part in creating the right ambience and aesthetic to a space.

2.3.3.3 Side Lighting

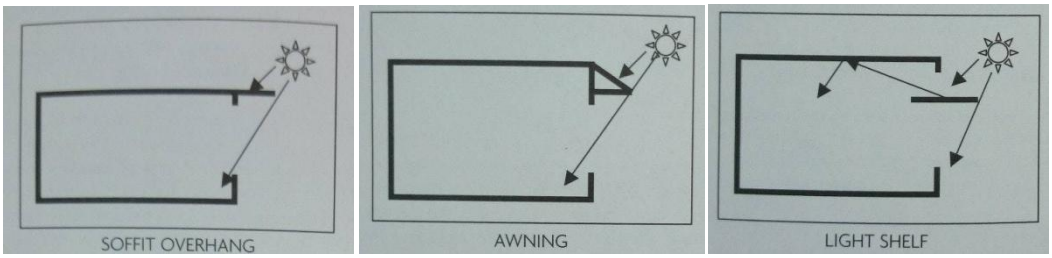


Figure 11. Side Lighting examples (Karlen & Benya, 2004)

Side lighting is commonly achieved through the implementation of vertical window openings that gain natural lighting for interior spaces. The difference between top lighting and side lighting is that side lighting; could create glare within the interior, as top lighting eliminates glare. However having view options with side lighting makes it acceptable to cope with glare issues. (Karlen & Benya, 2004).

Natural lighting and sun rays can penetrate from most angles such as south, east and west, this could create glare and unwanted heat generation. This can be prevented by some techniques of shading that correspond to different directions of lighting penetration. There are three examples in figure 11 that show different type of side lighting techniques that could be used. The first one starting from the right in figure 11 soffit overghang is a shading element that is limited and is mostly used on the south side on the northern hemisphere of buildings. Awnings are additions to soffit overhangs that mostly provide more shading elements that is mainly used on the east and west sides of buildings. Light shelf's are used to provide indirect lighting and act as a shading element; it also increases the depth of lighting that penetrates the space (Karlen & Benya, 2004)

2.3.3.4 Top Lighting

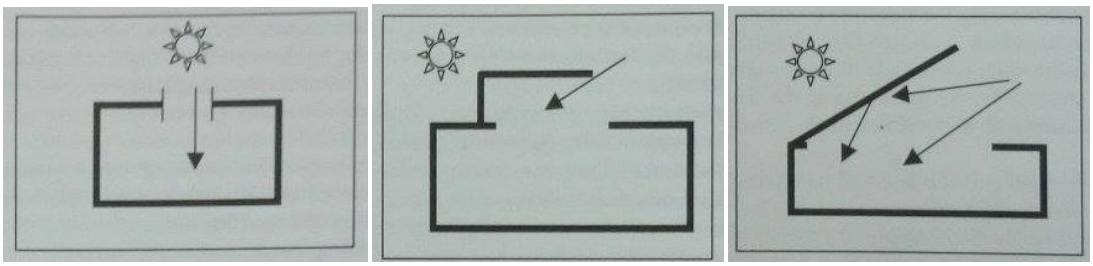


Figure 12. Top Lighting examples (Karlen & Benya, 2004)

Top lighting is commonly used in most spaces. It is commonly used to get day lighting to penetrate into spaces, top lighting functions in the same manner as artificial lighting with its directional behavior, downward radiations of sun light in providing top lighting. There are three examples showing different types of top lighting the first visual in figure 12 represents sky lighting, the second represents clerestory top lighting and the third saw tooth clerestory top lighting. Sky lighting is achieved with by allowing light to penetrate from above, and usually cover 5-6% of roofing space. Clerestory top lighting is achieve by the usage of high openings such as windows to gain natural lighting, the best possible solution is to face the openings north o there would not be direct sunlight that enters the interior. Sawtooth clerestory top lighting is achieved by slanting roofs that provide indirect top lighting that removes natural sunlight. It usually encompasses both direct and indirect lighting to get adjacent reflective natural lighting. (Karlen & Benya, 2004)

2.3.3.5 Developing Evaluation Criteria According to Methods of Lighting

The examples that were discussed above relate to how the evaluation is done for the case study examples, it shows what types of lighting methods are going to be looked at within these methods a certain aspect comes forward which is wall washing which is achieved through down and up lighting the examples will follow how the up

lighting and down lighting create wall washing or if wall washing is excluded for the designs. Three of these methods is in the evaluation tables within the analysis of the case study examples.

2.4 Evaluation Criteria for Lighting

Dr. John Flynn (1973- 1979) was one o the major researchers in the field of lighting perception and the effect that lighting has on sensations, moods of interior spaces. Along with other researchers such as Gibson (1979), Murdoch and Caughey (2004), Flynn was a leading pioneer in the field of lighting theory in the twentieth century. Murdoch and Caughey (2004) suggest that Flynn was also related with the psychological effects of lighting effects within spaces. one of the major hypothesis of Flynn (1973) on the implications of lighting, Flynn hypothesized that there are consistent and occurring change between lighting and the user of a space, however there is also a consistent occurring change with the impression of lighting within a space can have varied results(Flynn, 1973) .

More importantly Flynn (1979) was one of the first to delve into matters such as developing a criteria model that can be used to evaluate lighting within spaces. The work on the evaluation of lighting was finished approximately forty years ago. Flynn's initial work on this subject had follow ups by various other researchers. However the initial work of Flynn has been regarded as a seminal study to date. Flynn in conjunction to this study developed certain cues and keywords to understand users of the space, to gain a more accurate response to the way the user felt; emotions, sensations, moods, perception within the space that is lit. The subjective responses can be categories into cues that Flynn used the following is the keywords used for the responses:

Distribution of light

Uniform	Non-uniform

Levels of illumination

Bright	Dim

Lighting Using a semantic deferential scale

Overhead	Peripheral	Vertical surface

Flynn documented the way users of the space responded to the different types of lighting levels. he recorded the familiar responses that users made to create fixed terms to use when analyzing lighting, the reactions, attitudes and opinions of the users formed the criteria for analysis as follows (Flynn, 1979):

- Pleasant vs. Unpleasant
- Public vs. Private
- Spacious vs. Confined
- Relaxed vs. Tense
- Visually Clear vs. Hazy

Pleasant: The pleasant response was mainly used when lighting fixtures were not directly used from ceilings, the pleasant response was categorized into wall fixtures and light that was ambient and in-direct. This is considered to be non- uniform distribution of illumination. Light levels were controlled to suit the task and function of the space.

Public: Public lighting was preferably overhead lighting (ceiling lighting) and is classed as general lighting, it is a uniform distribution of illumination. Public spaces require higher levels of lighting.

Spacious: For the spacious feeling uniform lighting with evenly balanced distributions of ambient lighting on all surfaces is required, with an array of wall and ceiling lighting.

Relaxed: Relaxed interiors came from a non- uniform distribution of illumination, these types of lighting mainly come from wall washes and singular lamp fixtures at preferably low levels of lighting.

Visually clear: Visually clear spaces require a general peripheral luminance, with a high level of lighting for general spaces and task oriented spaces.

These are the criteria that Flynn used when evaluating lighting within spaces the way in which Flynn Derived his criteria module is by generalizing the results that he gain from the users of the spaces that he presented them with. He based his findings on the general consensus of what people thought, and how they perceived spaces with differentiating light levels, he then gathered the results to define what the common responses were for each space which led to forming the cues that created the criteria module that he used to evaluate a space lighting features.

2.5 Examples of lighting in deconstructive interiors

Figure 13. Deconstructive interior lighting 1 (URL 11)
Figure 14. Deconstructive interior lighting 2 (on the right) (URL 12)

The general basics of lighting has been discussed, along with the lighting methods in creating ambient effective interiors and exteriors, the deconstructive style has been discussed in general as to how the design style are implemented within deconstructive interiors. As discussed within the literature review deconstructive designs have a complex style, with unexpected twists and turns to the designs general outcome, the questions now are how the lighting coincides with the complexity of deconstructive interiors and exteriors. Figures (11) and (12) show smaller scale deconstructivist designs with interesting implementations with the methods that were discussed. In general what seems to occur in deconstructivist designs is the usage of natural lighting is significantly more than artificial lighting; artificial lighting is mostly used to compliment some of the design aesthetics of the general space. As seen in Figure (11) accent lights have been chosen to bring forward the design aesthetics of the space, the same lighting attitude has been used for Figure (12).

Figure 15. Deconstructive interior lighting 3 (URL 13)
Figure 16: Deconstructive interior lighting 4 (URL 14)

With the complexity of deconstructive buildings, Figures (13) and (14) show how openings and the angularity of the interior space could create interesting lighting patterns. Figure (13) shows the use of dominant natural lighting with different openings with reflective and shadow play. The effective lighting also comes from how the interior is arranged within deconstructive interiors, the design allows for lighting to be more significant in providing effects that match with the controlled chaos of the interior.

Figures (13) and (14) demonstrates how larger scale deconstructive interiors operate and gives the general feel for the design style of deconstructive interiors, the case studies will deal with larger scale public spaces, the lighting evaluation will be specific and in detail to how the actual interiors lighting share traits with the overall design of the buildings, it will explore how prestigious design in cooperate lighting within their infrastructure to define the best possible outcomes that are needed for successful lighting designs.

Chapter 3

INVESTIGATING DECONSTRUCTIVE BUILDINGS WITH A SPECIAL ATTENTION TOWARDS LIGHTING

3.1 Selection of examples: with the reason of selection

The examples chosen for this thesis comes from four architects. The projects have been chosen for each architect based on their contribution to deconstructivism, prestige and quality of design that is discussed within this chapter. The examples are going to be discussed thoroughly in a sense of what design elements they hold regarding deconstructivism and the way they in cooperate lighting within their designs. The Four chosen architects are Coop Himmelblau, Daniel Libeskind, Rem Kooolhaas and Zaha Hadid. Each architect is brought to light with the works and contributions they had on deconstructivist designs, alongside a brief analysis of the styles, lighting and design decisions they use. The most popular buildings of the architects were chosen. Two buildings from each architect are analyzed and used for evaluation. This chapter will go over the general philosophies of the architects chosen to see how their mind frame is connected to the case studies. Furthermore brief descriptions of the buildings chosen are necessarily significant in understanding what functions they present within the interiors and exteriors. Firstly the introductions to the architects are present, alongside their main philosophies bringing together the main meaning of deconstructivism as a whole with their design. The buildings have visual example and detailed explanations on the location design and general information. The evaluations have been carried out on each building bringing together the lighting of each building and the creation of spaces through lighting.

Coop Himmelblau

Figure 17. Coop Himmelblau (URL 15)

‘Form Mutation’ (Himmelblau, 2014)

The main philosophy that Coop Himmelblau states is that, the mutations of space through sculpturing and Form mutations, are one of the aspects of open architecture. The possibility of mutation of a form is not through circles but through the use of spirals you gain the powerful sensual and tangible transitions for a form to mutate (HimmelBlau,1986).

‘Our Architecture Has no Physical Ground Plan’ (Himmelblau, 2014)

The architecture of Coop Himmelblau states that they do not follow a physical Ground plan; to counter this they suggest that it is a psychic plan. The use of walls is eliminated. The spaces resemble pulsating balloons. The interiors are dormant to perception and the facades are the main face of the Architecture (Himmelblau,1968)

Daniel Lebiskind

Figure 18: Daniel Libeskind (URL 16)

One of the ground philosophies that Daniel Libeskind follows is that the buildings that he designs are fueled by the perception of human energy; the larger picture of his designs is that it complements the greater cultural context for where the design is being built. Libeskind is a lecturer that teaches at universities across the world. he lives in New York city with his work associate and wife Nina Libeskind (Libeskind, 2014).

The development of Libeskind's work takes an unexpected direction that is a contrast to the existing procedures of architecture; they take a form of and break through into excitement, adventure, and the overall mystery of architecture. By engaging in public and political realms Libeskind excludes Aspects such as form, function, and programming, by doing this the buildings take a dynamic turn into new dimensions (Libeskind, 2001)

Rem Koolhaas

Figure 19. Rem Koolhaas (URL 17)

Koolhaas is in favor of social progress and the advancements on global technology and its relationship between architecture. The ever growing changes leave him unfazed and optimistic. One of the main goals of Koolhass is to re-forge the lost

relationship between technology and progression. The unexpectedness of his designs is brought to life rather than a passive anticipation of agony (Koolhass, 2014).

Rem koolhaas states that he does not abide by a certain philosophy but he does add that he generally uses the word outcome to sum up his thoughts on his philosophy, his influence of fashion, media, and politics. He is a leading professor at the Harvard University, and supports outside projects. He is also one of the founders of the Oma Architectura Practices (Koolhass, 2014)

Zaha Hadid

Figure 20: Zaha Hadid (URL 18)

Zaha hadid has been one of the most influential architects in the contemporary scene she is always breaking the boundaries of architecture and landscaping design, she is generally regarded as the 'queen of curves'. she has a variety of work that experiments with a visionary aesthetics towards spatial quality, the extension and

gradually intensifying landscaping, that in cooperates and relates with all the fields of design, taking into account features such as urban scale planning to products, interiors, exteriors and furniture the commitment to modernism is one of the foundations that drives Zaha Hadid to pursuit her architectural style which is contemporary, innovative with new material usage and more importantly organic stylizations. The exclusion of ordinary comes through the usage of new technologies and materials through the processing of design ideas (Hadid , 2014).

3.2 Investigation of Selected Examples

These are the buildings that are selected for the examples that have been analyzed to determine the key points that need to be discussed within the role of lighting and the integration of lighting within such deconstructive style buildings. The analysis and evaluation of these buildings will be done through a criteria based model, where each of the buildings will be observed as to how they deal with the natural and artificial lighting balance, and what types of design elements are used to complement their general design of the building. Furthermore each of the examples will contain a table were comparisons can be made as to how each design solved the lighting solutions regarding the building itself.

Before the evaluations take place the general information regarding the projects that have been chosen will be explained in more detail supported by visual examples of the case studies that are chosen from each architect. The general information is arranged into tables where by visual examples, dates, locations and the architects responsible for the projects is present and their functions/activities. After the general information on the buildings that have been chosen, there is a series of tables that evaluate the lighting methods and fixtures within the case studies all of the

evaluations are filtered through the criteria module that is derived from the topics that were discussed above, mainly from the lighting section of the study, the different methods and solutions will be discussed, lastly a table is present containing all of the case studies with the outcomes of the evaluation this would be a sort of comparison table as to how each case have solved the lighting within the exteriors and interiors. Furthermore a conclusive text will bring together the points that need to be expressed regarding these solutions and further studies.

Architect: Coop HimmelBlau

Name of Building: Martin Luther Church

Year: 2007

Location: Munich, Germany

Project Information:

The main design element of this building is the roofing that covers the main area of the church the geometry is a formal enhancement of a medieval ossuary roof. Most of the interior space is illuminated by day lighting that also incorporates baptistery. There is a continual spatial space that runs through most of the interior uniting the interior as a whole, the bell tower to this church is situated on the outside and has its own design that corresponds to the roofing design of the church. The main interior spaces will be analyzed as to how the light enters and reflects off of certain areas of the interior. Furthermore detailed texts will identify the lighting methods that have been used along with the identification of the effects that the lighting offers. (Himmelblau, 2014)

Figure 21: Martin Luther Church 1 (URL 19)

Example 1 : Coop HimmelBlau, Martin Luther Church

Evaluation Criteria	
According to source	**Day Lighting:** Has been achieved by the main aperture, which is a conical skylight, supported by clerestory apertures and some rectilinear and circular apertures. These have been marked on the picture above.
	Artificial Lighting: Artificial lighting cannot be observed. Due to church operating daytimes.
Lighting design integration type	**Focal:** Sky lighting features make focal points of light enter into the space as seen in figure 20.
	Task: Task lighting is achieved through the beams of light that enter, which illuminates the entire space brightly to perform tasks such as reading.
	Ambient: The ambience of this space in figure 20 is actual beams of sun light that is reflected of off the wall surfaces and partition walls.
	Accent: The small shapes within the partition walls provide accents, with the same shapes of light passing through.
Methods of lighting	**Down lighting:** Most dominant form of lighting method.
	Up lighting: No up lighting observed.
	Wall washing: Wall washes can be seen within figure 20 with the reflective sun lighting of partition walls.

The Deconstructivist Character of The Building

The deconstructivist character of this building is identifiable with the roofing system that is implemented that also serves as the main lighting source and structural element of the building. Other structuring parts of the building also follow the roofing system. The lighting is hand in hand with the deconstructive style of this building.

Figure 22. Martin Luther Church 1 (URL 20)

Example 2 : Coop HimmelBlau, Martin Luther Church

Evaluation Criteria	
According to source	**Day lighting:** Natural lighting enters through the opening that is illustrated in figure 23
	Artificial Lighting: Exterior view of the building excludes artificial lighting.
Lighting design integration type	**Focal:** As seen in figure 21 the large openings in the roofing provides focal lighting spots.
	Task: The lighting in is generalized with brightly lit interiors.
	Ambient: The ambience is provided by the sun lighting level and beams of light that enter through the sky lighting openings.
Methods of lighting	**Down lighting:** Sky lighting openings create down lighting features.
	Up lighting: no up lighting features that are perceived.
	Wall washing: The reflective material creates opportunities for wall washing.

The Deconstructivist Character of The Building

Figure 21 shows a more expressive visual of the roofing system that creates the deconstrucive character of the main building; in addition it is the main lighting source the openings provide strips of beamed natural lighting for the interior space, which is where the services are held. The design of the roofing system is reflected into the interior through openings that follow the general design pattern.

Figure 23. Martin Luther Church 1 (URL 21)

Example 3 : Coop HimmelBlau, Martin Luther Church

Evaluation Criteria	
According to source	**Day lighting:** Day lighting has been achieved through the large glass opening which is presented within figure 24.
	Artificial Lighting: Artificial lighting cannot be perceived within the interior, due to the fact that the church operates during daytime hours.
Lighting design integration type	**Focal:** Focal is diminished by general lighting within this space no type of focal points of lighting.
	Task: The brightly lit interior, is efficient in providing circulative lighting features within figure 22.
	Ambient: The color of the glass roofing provides the right ambience within the interior.
	Accent: Accents can be perceived from the shadow particle that fall on to the floor of the space.
Methods of lighting	**Down lighting:** The whole space consists of down lighting from large openings.
	Up lighting: No up lighting can be perceived.
	Wall washing: The sun lighting that enters creates wall washes on the partition walls of figure 22.
The Deconstructivist Character of The Building	
Figure 22 is the entrance hall to the church in this example we can see that almost all of the space is supported by natural lighting, the whole ceiling of this interior is glass meaning that the intake of natural light is abundant. The main attraction of the roof can also be visible from this point. This adds a certain dynamic and aesthetic to the space.	

Figure 24. Martin Luther Church 1 (URL 22)

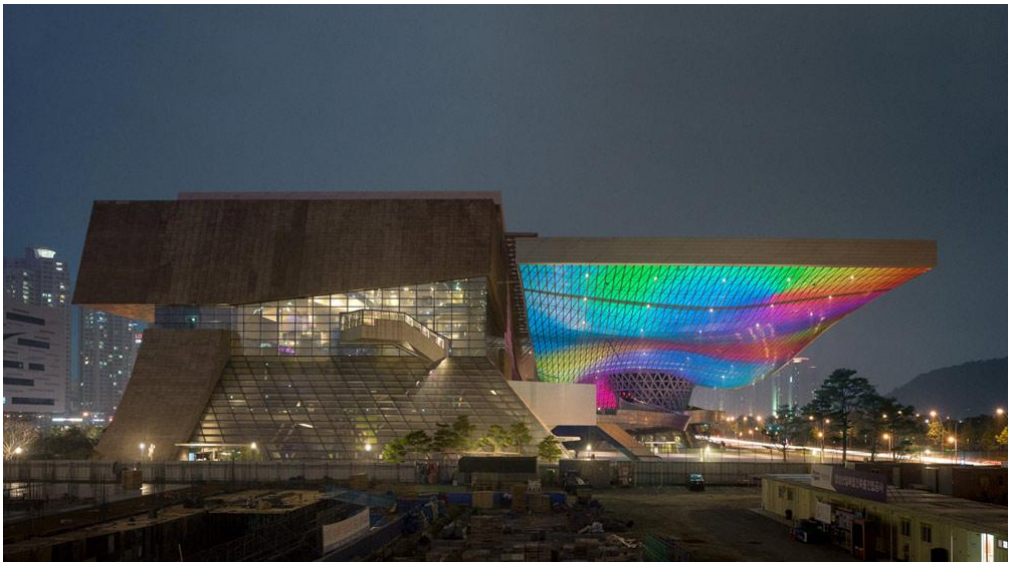
Example 4 : Coop HimmelBlau, Martin Luther Church

Evaluation Criteria	
According to source	**Day lighting:** The arrows on figure 23 represent how the day lighting penetrates and reflects of off the partition wall surfaces. Through the sky lighting opening.
	Artificial Lighting: Artificial lighting not present due to church services being day time.
Lighting design integration type	**Focal:** As seen in figure 23 the round opening is providing the large focal lighting within the interior the focal lighting also reflects of off the partition walls.
	Task: The task lighting of this space is according to the function of the space, the main areas that the task is going to take place are lit significantly.
	Ambient: The main attraction of the building is the roofing system that also adds to the general ambience and light intake of the building.
	Accent: The accents are visual within this example, as the beams of light are reflected off of the surfaces of the floor and the partition walls.
Methods of lighting	**Down lighting:** Main method of lighting through openings.
	Up lighting: No perceivable up lighting.
	Wall washing: Wall washes can be seen on the partition towards the rear of the interior space.
The Deconstructivist Character of The Building	
The main service area of the church receiving a lot of natural lighting intake, the partition wall at the rear end also provides a certain aesthetic and light penetrates through the odd shapes that are present on the partition wall. The character of the building follows the same general design principle of openings that provide light penetration features. Supporting the whole interior.	

Figure 23. Martin Luther Church 1 (URL 23)

Architect: Coop HimmelBlau

Name of Building: Busan Cinema Center



Year: 2011

Location: Busan, South Korea

Project Information:

Coop Himmelblau's Busan Cinema Center, also regarded as the 'Dureraum' meaning the enjoyment of watching movies all together in Korean, is the center point and official venue for the Busan international film festival. The main attractions of the Busan Cinema Center is the is the record for the longest cantilever roof which is documented into the Guinness world records. The interesting color patterns that brings forward the design of the roof is very intriguing. Opened in the year 2011 this Cinema host Entertainment facilities of the highest quality along with its interesting design patterns.

Figure 25. Busan Cinema Center. Case 2 (URL 24)

Example 1: Coop HimmelBlau, Busan Cinema Center

Evaluation Criteria	
According to source	**Day lighting:** Day lighting is achieved through **S**emi open area receives good amount of day lighting.
	Artificial Lighting: Main source of lighting during night time hours. As represented within figure 26
Lighting design integration type	**Focal:** No focal lighting observed; lighting seems to be even throughout.
	Task: Task lighting seems to appear as a form of directional lighting for circulation.
	Ambient: The ambience is brought to play by the material usage; reflective materials play a general role in ambience.
Methods of lighting	**Down lighting:** Mixture of both lighting methods.
	Up lighting: Mixture of both lighting methods.
	Wall washing: Extensive wall washing features on the ceiling.
The deconstructivist character of the building	
As seen in figure 24, only artificial lighting has been used but this is due to the picture being captured at night. Actually, artificial lighting is used in collaboration with daylighting. The lighting fixtures compliment the interesting design of this building and the materials used. Reflective surface materials have been used for the ceiling of the semi-interior space. Therefore most of the lighting elements are hidden up lighting elements that reflect indirec t light of off the ceiling. This creates an ambient feel to the space, with a variation of lighting levels on ceilings or walls to create the desired effect and add to the design aesthetics of the space.	

Figure 26. Busan Cinema Center. Case 2 (URL 25)

Example 2 : Coop HimmelBlau, Busan Cinema Center

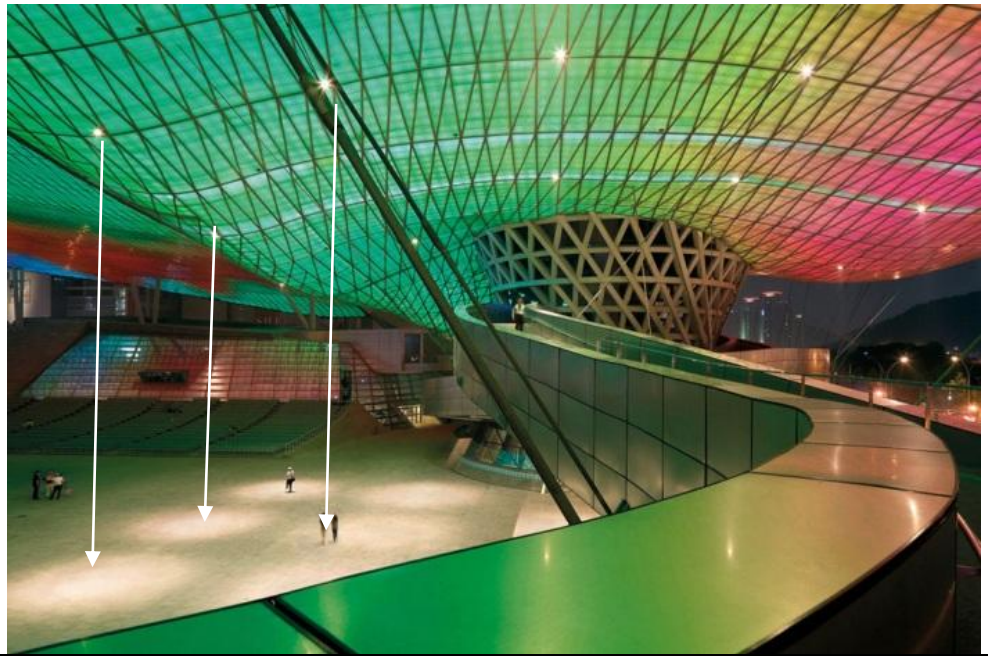
Evaluation Criteria	
According to source	**Day lighting:** The enclosed space receives no day lighting in figure 27.
	Artificial Lighting: Main source of lighting. The lighting is achieved through the lighting fixtures on the walls and on the ceiling seen in figure 27.
Lighting design integration type	**Focal:** General lighting is used, no type of focal lighting can be observed.
	Task: Task lighting in the form of visually bright for directional measures.
	Ambient: Ambience is created from the red material usage with lighting that brings forward the materials.
	Accent: Accent lighting can be observed walls, adding a wall wash effect.
Methods of lighting	**Down lighting:** Mostly used method of lighting.
	Up lighting: Up lighting can be observed at the rear end of the interior.
	Wall washing: Wall washing can be seen on almost all boundaries within the space.

The deconstructivist character of the building

The interior of the cinema uses different lighting fixtures and combinations of light sources. The mostly used lighting method is down lighting which can be seen from the arrows on figure 25, there are some up lighting towards the back of the interior which changes the dynamics of the lighting due to the color it gives the interior. The function of this interior is a cinema and theatre hall, so the lights we see are mostly turned down to a dim interior lighting . Brightly lit interior, with the effect of accents and wall washing techniques, separating the spaces and floors of the interior. The lighting used here is bright so that people can navigate within the interior to find their seats, the design resembles standard theatre models, the lighting is only meant for the functionality rather than aesthetics also it does support the richness of the interior.

Figure 27. Busan Cinema Center, Case 2 (URL 26)

Example 3 : Coop HimmelBlau, Busan Cinema Center



Evaluation Criteria	
According to source	**Day lighting:** The day lighting is achieved by this space being asemi open space with day lighting features.
	Artificial Lighting: Main source of lighting during night time hours. With colored lighting and main focal lighting fixtures seen in figure 28.
Lighting design integration type	**Focal:** Focal lighting can be observed to light up the main space of this interior.
	Task: No specific task lighting.
	Ambient: The ambience is brought by the dynamic colored lighting on the ceiling of this space.
	Accent: The accents may be perceived by the structuring of the roofing system with colored dynamic lighting.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: Wall washing can be seen on the ceiling of the design.

The deconstructivist character of the building

In figure 26 the lighting is very interesting due to there being a wash of different colors of light that covers the ceiling of the semi open space, this lights change in color, which makes a dynamic mood for the space, the dominant lighting is the colored lights we see on the ceiling, however there are lighting fixtures that shine light towards the ground so that it is more balanced and not overdone by colored lights, the down lighting can be seen in figure 26 with the arrows showing the areas that are lit. The design of the semi open courtyard resembles organic wave like patterns which are supported by the vitiating colors of light, this adds to the general atmosphere and ambience of the space.

Figure 28. Busan Cinema Center. Case 2 (URL 27)

Example 4: Coop HimmelBlau, Busan Cinema Center

Evaluation Criteria	
According to source	**Day lighting:** Figure 29 illustrates the same space as figure 28 the difference being it is during day time hours. Day lighting penetrates through the sides of this space.
	Artificial Lighting: As seen in figure 29 day lighting is present. However artificial lighting is still being used by fixtures, supporting the illumination of this semi open space,
Lighting design integration type	**Focal:** No focal lighting method can be observed in this example.
	Task: The task lighting is achieved through the general lighting of the space.
	Ambient: The ambience is present with the artificial lighting elements of the space.
	Accent: Accents can be seen on the left hand side behind the seating elements.
Methods of lighting	**Down lighting:** Extensively used method of lighting .
	Up lighting: Can be observed from the reflective ceiling materials.
	Wall washing: The general lighting provides the wall washes on the ceiling of this space.

The deconstructivist character of the building

Figure 27 is the same space as figure 26 although without the vitiating colors due to the time of day, however there is still artificial lighting that supports the huge roofs that covers the space. The interesting thing about the lighting of this building is that most of the lighting that is used is hidden and not seen, with the use of the reflective materials on the ceiling to reflect light rather than it being direct. The Bussan cinema center has a diverse lighting arrangement which complements the interior and exterior of the building in many ways, the interesting lighting solutions paired with the reflective material usage brings forward the deconstructive style of the building.

Figure 29. Busan Cinema Center, Case 2 (URL 28)

Architect: Daniel Libeskind

Name of Building: The Run Run Shaw Creative Media Center

Year: 2010

Location: Hong Kong

Project Information:

The facilities in the Creative media centre enable the university to develop and offer the highest form of education and be the first too in Asia within the field of creative media. The building follows a concept of crystalline structuring and design forms. There are a variety of spaces which are rich in the aspects of form, light, modern technology, and material when brought together forms interactive spaces for research and creativity. Some of the functions that are provided within this building are multi- purpose areas, theatre, laboratories, stages, lecture rooms, exhibition halls, restaurant and cafe. There are also public exterior spaces with landscaping where students can interact. (Lebiskind, 2014)

Figure 30. The Run Run Shaw Creative Media Center. Case 3 (URL 29)

Example 1: Daniel Libeskind, The Run Run Shaw Creative Media Center.

Evaluation Criteria	
According to source	**Day lighting:** This space is an enclosed space that does not receive day lighting therefore it is supported by artificial lighting.
	Artificial Lighting: The artificial lighting is achieved from lighting fixtures on the walls and ceiling of this space creating a brightly lit interior.
Lighting design integration type	**Focal:** No focal lighting element.
	Task: Task lighting can be observed with brightly lit interior according to function.
	Ambient: Ambience is a secondary due to the space being a lecture hall therefore bright lights have been used.
	Accent: Accent lighting could be observed on the right side of the wall with striped lighting fixtures.
Methods of lighting	**Down lighting:** Mixture of both lighting methods.
	Up lighting: Mixture of both lighting methods.
	Wall washing: Wall washing techniques can be seen on left side of the hallway.

The deconstructivist character of the building

The effects of the lighting within this interior is an energetic bright, and space defining lighting, it is visually clear, with no distractions of shadows and other types of dim areas. The lighting follows the function of the lecture room. Being a lecture area the design of the window opening gives extra space to the actual lecture space and provides light to travel both ways creating a brightly lit space.

Figure 31. The Run Run Shaw Creative Media Center. Case 3 (URL 30)

Example 2: Daniel Lebiskind, The Run Run Shaw Creative Media Center

Evaluation Criteria	
According to source	**Day lighting:** The day lighting of this space seen in figure 32 has been achieved through a wall opening horizontally, supporting the general illumination of the space.
	Artificial Lighting: Artificial lighting comes from the fixtures on the ceiling. Stripe shaped lighting elements have been used, that can be observed in figure 32.
Lighting design integration type	**Focal:** Focal lighting is eliminated however the design of the striped lighting fixtures makes for the focal lighting aesthetic.
	Task: Brightly lit interior space to make activities easier to handle.
	Ambient: The striped lighting features create the general ambience of this space creating a brightly lit interior.
	Accent: Extensively used lighting integration type with the striped lighting fixtures creating accents on the walls and ceiling.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: Wall washing can be seen where the strips of light end at a wall.

The deconstructivist character of the building

The effects of the lighting within this space reflect aesthetics and also providing general lighting for the space, notice the window openings have a certain shape that follows the lighting elements on the ceiling. The general idea of the ripped lines for lighting elements show in most of the interior. The stripped lines as lighting fixtures reflect the general design of this deconstructive building the lines represent the deconstructive chaotic style; although the space is standard the lighting shows how a space can change according to the lighting fixtures.

Figure 32. The Run Run Shaw Creative Media Center. Case 3 (URL 31)

Example 3: Daniel Libeskind, The Run Run Shaw Creative Media Center.

Evaluation Criteria	
According to source	**Day lighting:** This space is an enclosed space with no day lighting features.
	Artificial Lighting: The artificial lighting is achieved through the striped and spot lighting fixtures seen in figure 33.
Lighting design integration type	**Focal:** Focal lighting could not be observed.
	Task: Lecture hall as function task lighting plays the role of general and brightly lit interior.
	Ambient: The ambience is created through the red wall that has accents of lighting to add to its aesthetical value.
	Accent: As seen in other examples striped lighting features create accents on ceiling and wall of the space.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There are no up lighting that could be observed.
	Wall washing: Wall washing can be seen on the red background wall of the space.
The deconstructivist character of the building	
The brightly lit interior gives this space energy and clarity where students don't have trouble reading from papers or facing any problems visually the stripes of light is used for aesthetical purposes and also providing general lighting for the space. The general design within this building follows the deconstructive style with its crystalline design and the striped lighting fixtures that mostly add the design as an aesthetical element that also provides general lighting along with accenting spaces for dynamic and energetic looking lighting.	

Figure 33. The Run Run Shaw Creative Media Center. Case 3 (URL 32)

Example 4: Daniel Libeskind, The Run Run Shaw Creative Media Center.

Evaluation Criteria	
According to source	**Day lighting:** There is a mixture of both sources in figure 34; the day lighting is achieved through a horizontal opening.
	Artificial Lighting: Artificial lighting fixtures have been used on the ceiling in the form of spot lighting, which can be seen in figure 34.
Lighting design integration type	**Focal:** A focal point of light can be observed at the rear end of the space.
	Task: Task lighting can be seen on ceiling with spot lighting fixtures to light the main area of the space.
	Ambient: The ambience comes through the general design and mixture of lighting integrations.
	Accent: The lighting seen in the back of the space has an accent aspect creating spots of lighting on the wall.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: Wall washing can be perceived in the rear end of the space.

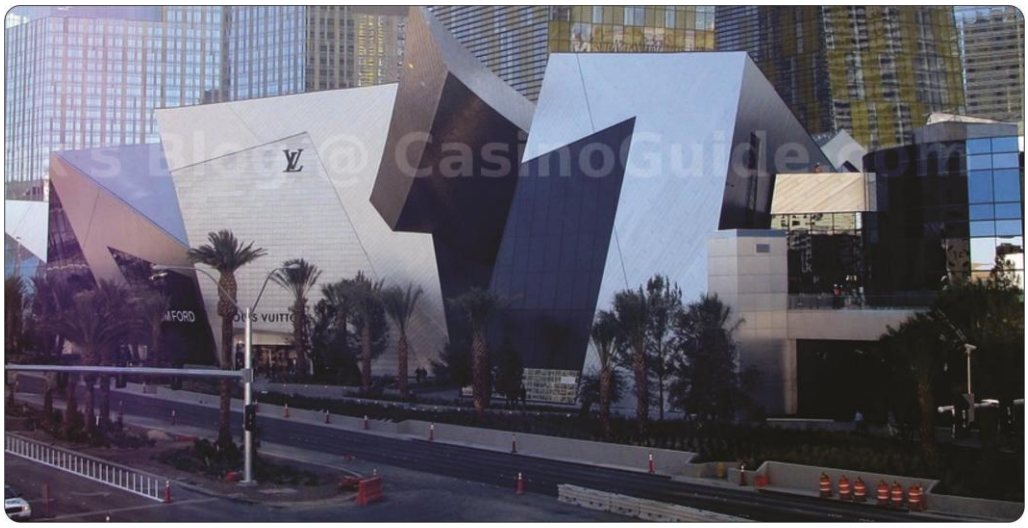
The deconstructivist character of the building

The function of this space is a meeting room, and an area where students can go other studies. The lighting offered within this interior is mostly given off of spot lighting elements that are mostly formed as down lighting, there is a mixture of natural lighting and artificial lighting that lights up the interior brightly. There are also accent lighting which can be seen in the edges of the ceiling giving of blue light these lights are mostly aesthetics based to provide a different feel to the room. The shiny reflective surface of the table gives of light from the spots that are directed on to it. It is important to note the singular and random stripes we see throughout this building it brings together the building as a whole by showing how lighting elements and fixtures that follow each other as a design element can bring spaces to be integrated to the general design of this building.

Figure 34. The Run Run Shaw Creative Media Center. Case 3 (URL 33)

Architect: Daniel Libeskind

Name of Building: Crystal at City Center



Year: 2009

Location: Las Vegas Boulevard, United States America

Project Information:

The Crystalline style is home to Denial Libeskind with this design the crystalline structuring is present along with the facade play of metal clad, the contrast with this design according to the context that the building is located in is the untraditional style that crystalline structuring brings. This building hosts as a multi-functional retail store which include brands such as Louis Vuitton, Tiffany & co, and Bulgari. There is a staggering and aesthetic entry way that pulls pedestrians into the main interior space which has a spiraling roof structure. the openings to sky lighting, in unexpected angular patterns makes for a luxurious retail experience coupled with dining areas.

Figure 35. Crystal at City Center, Case 4 (URL 34)

Example 1: Daniel Libeskind, Crystal at City Center

Evaluation Criteria	
According to source	**Day lighting:** Figure 36 shows a closed space with no day lighting features.
	Artificial Lighting: The artificial lighting is made up of different store lighting and main fixtures to light the general space seen in figure 36.
Lighting design integration type	**Focal:** No particular focal lighting used the main object in the design has reflective qualities that create the focal point in the design.
	Task: General lighting for circulation purposes, lighting the interior evenly.
	Ambient: Ambience is achieved through different lighting levels from different sources.
	Accent: Accents can be observed close to the ceiling of this space.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing:

The deconstructivist character of the building

he desired lighting effect within this interior is an ambient style general lighting, it has a more casual feel rather than design approached lighting element, moreover the stores within this building actually provide their own designs and lighting solution, therefore it could be that the actual building adopted a more casual style to its lighting approach. The main area of the mall, figure 34 shows how the lighting acts as a general lighting method rather than a design element within the space. In figure 34 almost all the lighting elements are hidden, creating ambience, however this example in comparison to the previous projects that were analyze has no specific emphasis on lighting and the design, it's just adequate enough to light the spaces in an even way.

Figure 36. Crystal at City Center, Case 4 (URL 35)

Example 2: Daniel Libeskind, Crystal at City Center

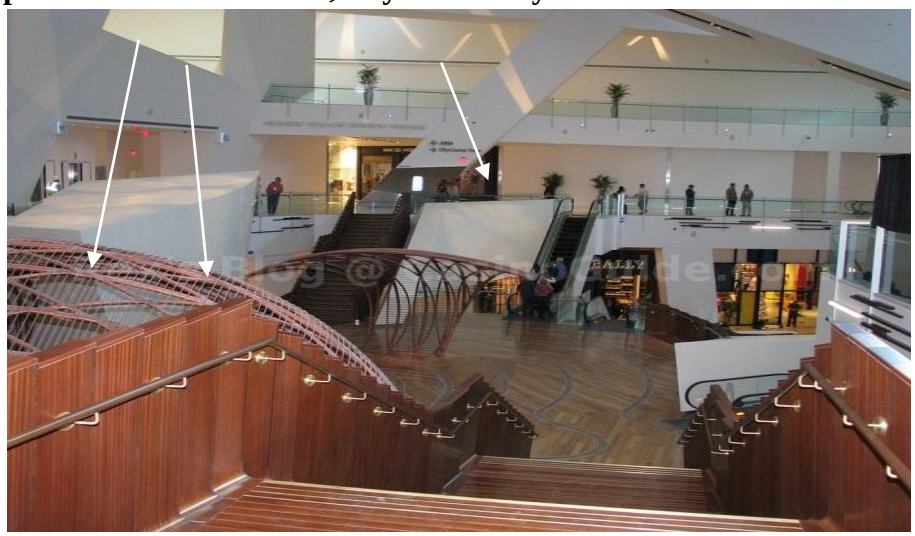
Evaluation Criteria	
According to source	**Day lighting:** The day lighting is achieved through the large opening at the back of the space seen in figure 37.
	Artificial Lighting: The artificial lighting is achieved through the fixtures that accent down on the walls of the interior. In addition the lighting also comes from different store lighting.
Lighting design integration type	**Focal:** Wall opening serves as a focal point with natural lighting.
	Task: The main sky lighting openings light the main space of church, also functioning as task lighting.
	Ambient: Natural lighting levels vary during day time hours creating different ambient settings and dynamic lighting.
	Accent: Various accents have been used on the walls close to the ceiling.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: there is no up lighting that could be observed.
	Wall washing: Wall washing can be seen in the background close to the ceiling of this example with warm colored lighting.

The deconstructivist character of the building

In figure 35 we can see the general layout of the interior, with various stores window openings and efficient lighting, due it needing to be clear for customers to navigate throughout the interior. In the background certain lighting accents can be seen that is very faint and not following any particular design element of the building. The general lighting of this interior is sufficient although it does not hold the same effect as the other case studies that have been analyzed.

Figure 37. Crystal at City Center, Case 4 (URL 37)

Example 3: Daniel Libeskind, Crystal at City Center



Evaluation Criteria	
According to source	**Day lighting:** Day lighting can be perceived on the top right hand side of the space, creating efficient lighting.
	Artificial Lighting: Different artificial lighting can be perceived; it is achieved through different types of fixtures creating stripes of lighting.
Lighting design integration type	**Focal:** No focal lighting can be observed.
	Task: No task lighting can be observed.
	Ambient: The ambience could be perceived as the accents of stripes that are on the rear walls.
	Accent: Accent lighting can be observed at the rear end of the space.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: Wall washing can be perceived on the upper columns of the space.

The deconstructivist character of the building

In this figure 36 we see the interior from the staircase here the light is represented from the mixture of natural lighting and artificial lighting various deconstructive forms can be perceived with stripes of lighting that can be seen that is from an artificial light source, the main function of this hall area is a navigation point to different areas of the mall the window openings seem to be hidden and natural light enters the mall during day time hours.

Figure 38. Crystal at City Center, Case 4 (URL 38)

Architect: Rem Koolhaas

Name of Building: Seattle Central Library

Year: 2004

Location: Seattle, United States of America

Project Information:

This buildings primary function is a central library in Seattle public library system. the building's main spaces hosts different array of activities such as the main book collection, governmental publications, visual materials, and technologies to transport information from physical to virtual collections which make up the main online library. The main design of this building is made up from the division of eight horizontal layers, the sizes are varied and matched for the function that is presented, the main structural element of this building is the steel and glass skin that is the cover of the main facade bringing together the design it also defines and gives identity to the main public spaces.

Figure 39. Seattle Central Library. Case 5 (URL 39)

Example 1: Rem Koolhaas, Seattle Central Library

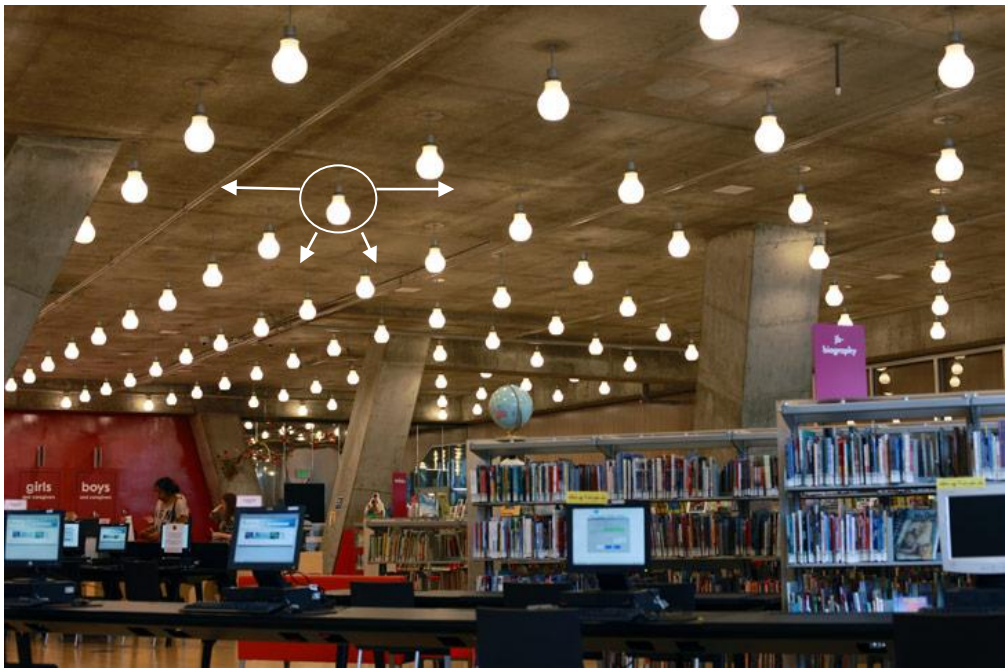
Evaluation Criteria	
According to source	**Day lighting:** The day lighting is achieved through the exterior structuring. Allowing large amounts of natural light to penetrate the interior.
	Artificial Lighting: Artificial lighting is only used for task purposes for reading tasks that will be observed in other examples.
Lighting design integration type	**Focal:** Due to the interior being lit by extensive use of day lighting there is no focal lighting that could be observed.
	Task: Task lighting fixtures can be seen as small lamps lighting small areas so people can read.
	Ambient: The ambience is provided from the structural elements of the exterior façade creating the general feeling of the interior.
	Accent: The accents are provided by shadows from the main exo- skeleton of the façade.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There are certain pots that provide up lighting.
	Wall washing: The large column on the left has the shadow particles from the large amount of natural lighting that enters the building.

The deconstructivist character of the building

In this figure 38 the need for brightness and clarity to perform tasks such as reading is clearly present with an extended significance to natural lighting. The problem however is the shadowing that the exterior façades create within the interior this is eliminated with artificial task lighting. Even with the shadowing from the exterior glass the shadows act as a secondary design element in creating textural wall lighting. This buildings design decisions towards its lighting clearly points to the abundance of natural lighting during the day, with the use of artificial lighting as a secondary means of illumination.

Figure 40: Seattle Central Library, Case 5 (URL 40)

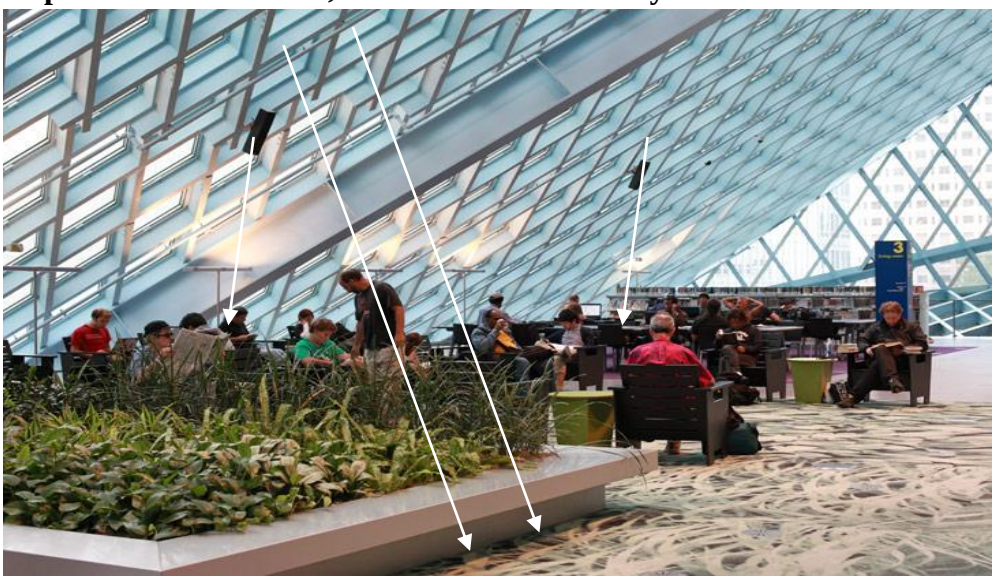
Example 2: Rem Koolhaas, Seattle Central Library



Evaluation Criteria	
According to source	**Day lighting:** The position of the day lighting cannot be perceive however from figure 41 we can see day lighting penetrating from the left hand side of the interior.
	Artificial Lighting: The artificial lighting is achieved from the lighting fixtures seen in figure 41, the lighting color has an ambient color not to bright; the number of artificial lighting is increased however the lighting color is more dimmer.
Lighting design integration type	**Focal:** The lighting is of more general space lighting there for no focal points can be observed.
	Task: Task lighting is provided by the lamp fixtures.
	Ambient: The ambience of this interior space is from the lamp light levels being more dim and relaxed.
	Accent: No accents can be observed.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: No wall washing that could be observed.
The deconstructivist character of the building	
The function of this area is the library itself where the books are kept. Therefore extensive lighting is not needed. In figure 39 the general lighting takes on an ambient role and the actual lighting fixtures represent a design element within the space evenly distributing artificial lighting with a toned down source of light, creating the characteristics of the space; relaxing browsing setting where people can take their time to choose a book to read. The design of this interior is brought to life through the use of the lighting fixtures that are present within figure 39. The lighting fixtures compliment the function and the design of the library.	

Figure 41. Seattle Central Library. Case 5 (URL 41)

Example 3: Rem Koolhaas, Seattle Central Library



Evaluation Criteria	
According to source	**Day lighting:** As explained above the majority of the space is naturally lit with large structural openings of the exterior façade.
	Artificial Lighting: The artificial lighting can be observed in figure 42; it is a task lighting element that lights spots that require more focused lighting.
Lighting design integration type	**Focal:** Extensive use of sky lighting creates the major focal point.
	Task: The task lighting could be seen on the walls as small lighting fixtures.
	Ambient: The general ambience is provided by the reflectance of shadows from the exterior façade.
	Accent: Accents are made from shadow patterns of the exterior.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: The fixtures that are pointing downwards light wash the structural skeleton of the building.

The deconstructivist character of the building

From figure 40 we can perceive that this building in cooperates a lot of natural lighting, the space that is presented in figure 40 is the general reading area, there is an abundant use of natural light, but as seen in this figure there are artificial lights that serve as task lighting for the function that is presented. During daytime hours this library gets its light from natural sources saving in energy consumption and delivering a dynamic formation of openings. The whole building in fact takes in natural light due to it being made of steel structuring and glass. The design of the actual exterior surface with the crystalline structure acts as a glass exterior that almost takes natural lighting from all directions.

Figure 42. Seattle Central Library. Case 5 (URL 42)

Example 4: Rem Koolhaas, Seattle Central Library

Evaluation Criteria	
According to source	**Day lighting:** Main source of lighting.
	Artificial Lighting: Main source of lighting.
Lighting design integration type	**Focal:** As observed in previous examples the interior is subject to large openings therefore allowing building to stand out.
	Task: -
	Ambient: During night time the lit interior is brought to life and stands out for itself.
	Accent:
Methods of lighting	**Down lighting: -**
	Up lighting: -
	Wall washing: -

The deconstructivist character of the building

Figure 41 shows the exterior of the library in a night time setting. During day time hours the building is flooded with natural lighting. However as seen in this figure it supports artificial lighting during nighttime hours. The exterior facades and the textural glassing significantly amplifies the deconstructive style of this building and uses it to create diverse lighting solutions with the visual aesthetic during all times of the day. Natural lighting during the day brings the façade indoors; artificial lighting at night brings forward the façade at night time hours. The main structural element of the design with this building is actually the main light source that is used within daytime and nighttime hours the textural patterns and shape of the building comes to life with the lighting solutions that is meant for this building.

Figure 43. Seattle Central Library. Case 5 (URL 43)

Architect: Rem Koolhaas
Name of Building: Casa da Música

Year: 2005
Location: Porto, Portugal
Project Information: http://www.sagmeisterwalsh.com/work/project/casa-da-musica-identity/
This building resides in one of the most traffic orientated areas of Porto Portugal, city center also known as Rotunda da Boavista. The function of the building is a music center which houses different types of musical influences, the main concepts for this building is the differentiations of variety in music forms the facades of this building, Rem Koolhaas defines this design as the organization of issues of symbolism, this definition is the meaning derived from studying the structure which's identity becomes the actual logo for the building.

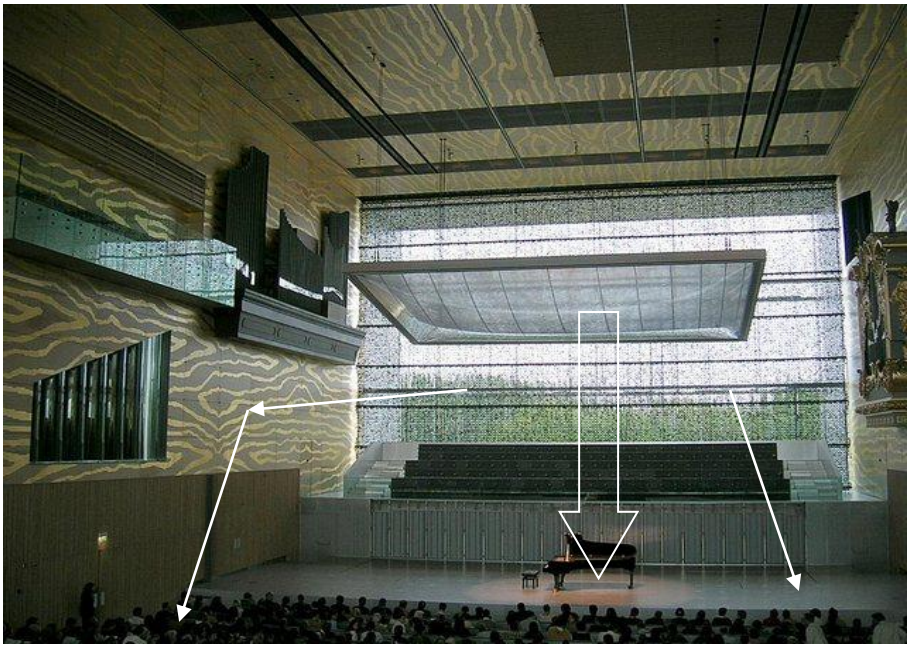
Figure 44. Casa da Música. Case 6 (URL 44)

Example 1: Rem Koolhaas, Casa da Música

Evaluation Criteria	
According to source	**Day lighting:** As represented in figure 46 the natural lighting is achieved through a large opening. Allowing large amounts of natural lighting to enter.
	Artificial Lighting: Artificial lighting fixtures can be seen which is fixed into the sound proofing elements of this space.
Lighting design integration type	**Focal:** The major opening provides the focal point within this space.
	Task: Task lighting can be observed from the ceiling pointing in downward directions for workspaces.
	Ambient: The general ambience could be influenced by differentiating day lighting patterns.
	Accent: No accent lighting could be observed.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: The small spots of lighting on the right side wall and ceiling provide small amounts of light washing.
The deconstructivist character of the building	
The main function of the space presented in figure 44 is a lecture hall/ learning area. The main source of light entering this area is natural light, through the large opening; the walls of the interior have textural covering providing an acoustic treatment, with artificial lighting elements placed in between the textures. The lighting is bright and clear with task lighting to balance and maintain the function of the interior. The general emphasis of the lighting within this space is the large opening that provides extensive lighting for the interior through natural sources during day time hours. The design of the opening is also a main design element of the exterior visual.	

Figure 45. Casa da Música. Case 6 (URL 46)

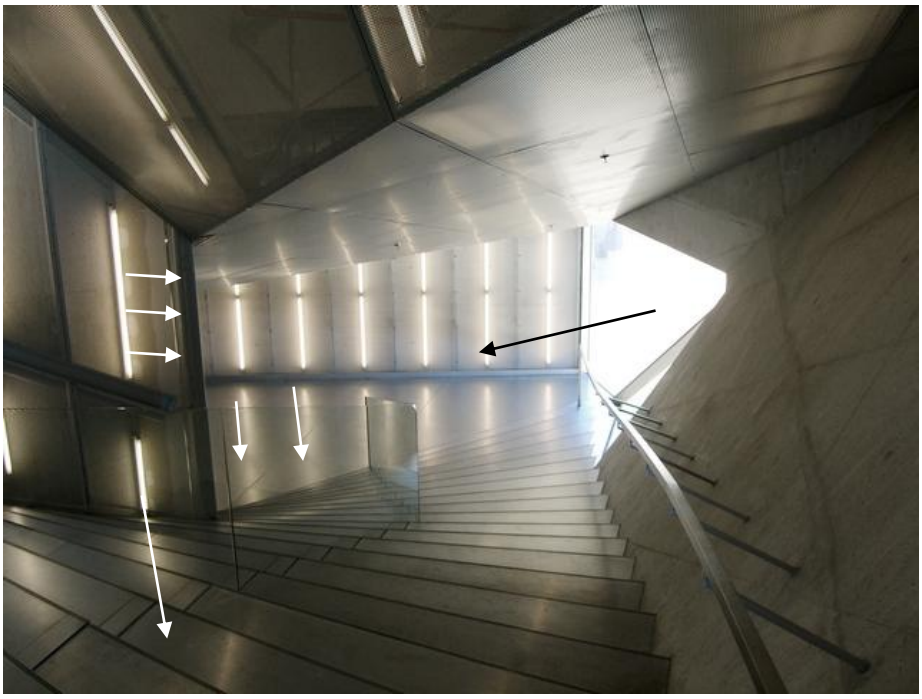
Example 2: Rem Koolhaas, Casa da Música



Evaluation Criteria	
According to source	**Day lighting:** The natural lighting is achieved through the background opening of the space, lighting the whole interior.
	Artificial Lighting: The artificial lighting is used as a focal and task lighting it lights the main space, where the piano is located in figure 47.
Lighting design integration type	**Focal:** Can be observed from the large spot on the piano of this space.
	Task: The large spot lighting on the piano acts as a task lighting for the performer.
	Ambient: The general ambience is brought by the general design of the opening that provides extensive day lighting.
	Accent: The light coming from the opening creates the wall materials accents to shine.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: The huge opening of natural lighting reflects and wall washes the sides of the interior to get certain aesthetical texturing.
The deconstructivist character of the building	
This space is the main performing area, artificial lighting cannot be seen as they are hidden the only artificial lighting source that can be seen in this visual is the spot lighting that is directly above the piano, the wall elements that are present within this space acts as acoustic treatments for this interior. The lighting that is provided within this interior compliments mostly the wall texturing by highlighting the walls. Significance to natural lighting has been given in this interior with artificial lighting acting as a spot rather than a design element.	

Figure 46. Casa da Música. Case 6 (URL 47)

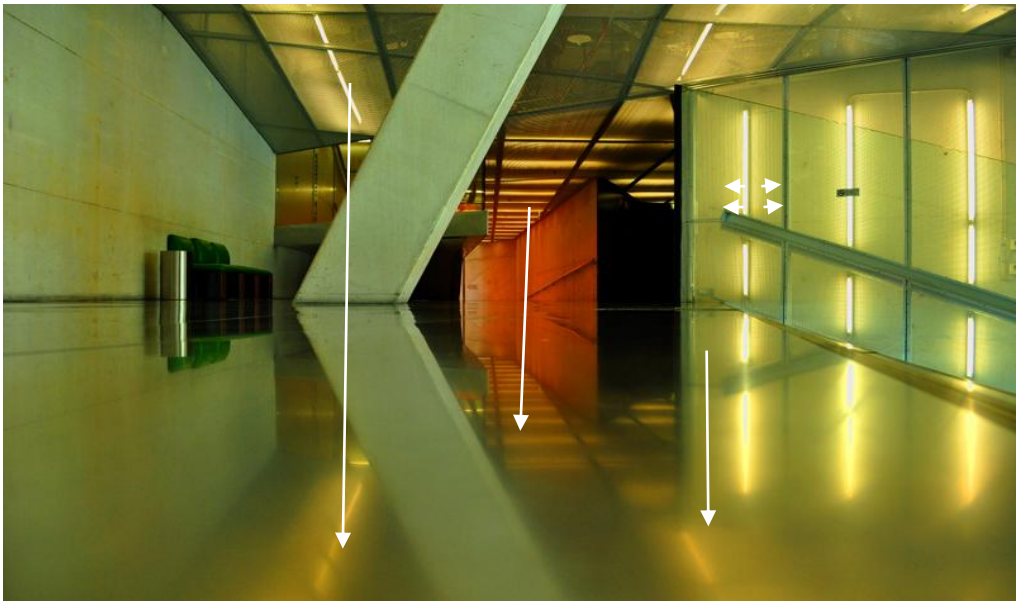
Example 3: Rem Koolhaas, Casa da Música



Evaluation Criteria	
According to source	**Day lighting:** The natural lighting penetrates from the right hand side of figure 48. It also has both sources of lighting.
	Artificial Lighting: The artificial lighting is achieved by the lighting fixtures on the walls of this space represented in figure 48.
Lighting design integration type	**Focal:** The staircase leads to an opening which provides a focal day light.
	Task: On certain task lighting can be seen.
	Ambient: The reflective materials create the general ambient feeling.
	Accent: Accents can be seen with the lighting fixtures on the walls with reflective materials reflecting light on flooring and ceiling.
Methods of lighting	**Down lighting:** Mixture.
	Up lighting: Mixture.
	Wall washing: There is an extensive use of wall washing coming from the lighting fixtures of the walls in this space.
The deconstructivist character of the building	
The staircase within the interior of this building can be seen in figure 46 the artificial lighting elements and reflective surfaces give this space a dynamic feel with the irregular and angular walls and ceilings the space feels psychedelic and aesthetically irregular. The lighting elements play the role of adding aesthetics alongside providing sufficient lighting for this closed space. The general design of this space is brought to life with the lighting elements that we can perceive the reflective surfaces make the artificial lighting become part of the design.	

Figure 47. Casa da Música. Case 6 (URL 48)

Example 4: Rem Koolhaas, Casa da Música

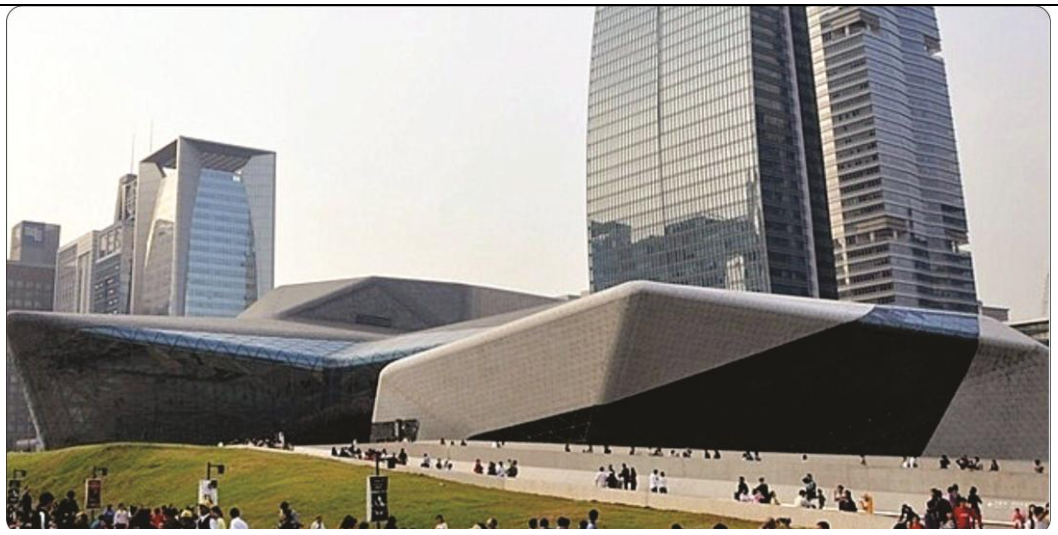


Evaluation Criteria	
According to source	**Day lighting:** The Closed space features no day lighting possibilities that could be observed.
	Artificial Lighting: Artificial lighting is extensively used in this space with fixtures on the walls and the ceiling. The reflective flooring material offers accents of the artificial lighting.
Lighting design integration type	**Focal:** No main focal observable lighting.
	Task: No main task lighting.
	Ambient: The color of the light and the accent features create the ambience of the space.
	Accent: Accents can be seen on floor reflections and wall fixtures.
Methods of lighting	**Down lighting:** Mixture of both.
	Up lighting: Mixture of both.
	Wall washing: Wall washing and flooring lighting due to material can be visible.
The deconstructivist character of the building	
As discussed above the reflective surfaces can be seen in nearly all of the spaces that are present which adds a certain dynamic to the space the lighting follows the material usage and the variation of design element and material usage makes up for the characteristic of this interior. Natural lighting have only been used in the performing or human activity areas of the building the rest of the enclosed spaces benefit from the artificial lighting. In this building an emphasis can be perceived as to how the lighting plays a role in different areas natural lighting being mostly used in spaces that the public use activity areas and concert halls. Other than that the enclosed spaces act as navigation points where artificial lighting has been used.	

Figure 48. Casa da Música. Case 6 (URL 49)

Architect: Zaha Hadid

Name of Building: Guangzhou opera house



Year: 2010

Location: China

Project Information:

This design by Zaha hadid has become one of the largest performing centers within southern China. The freestanding element of this design is its capture point for its audience the concrete auditorium (freestanding) over extending with glass clad facades took over 5 years to build. The dramatic design of this building led to many inspirations such as the fashion designer Vivienne Tams fall collection. The linear path with its organic feel and integration with glass is one of the main features behind this design.

Figure 49. Guangzhou opera house. Case 7 (URL 50)

Example 1: Zaha Hadid, Guangzhou opera house

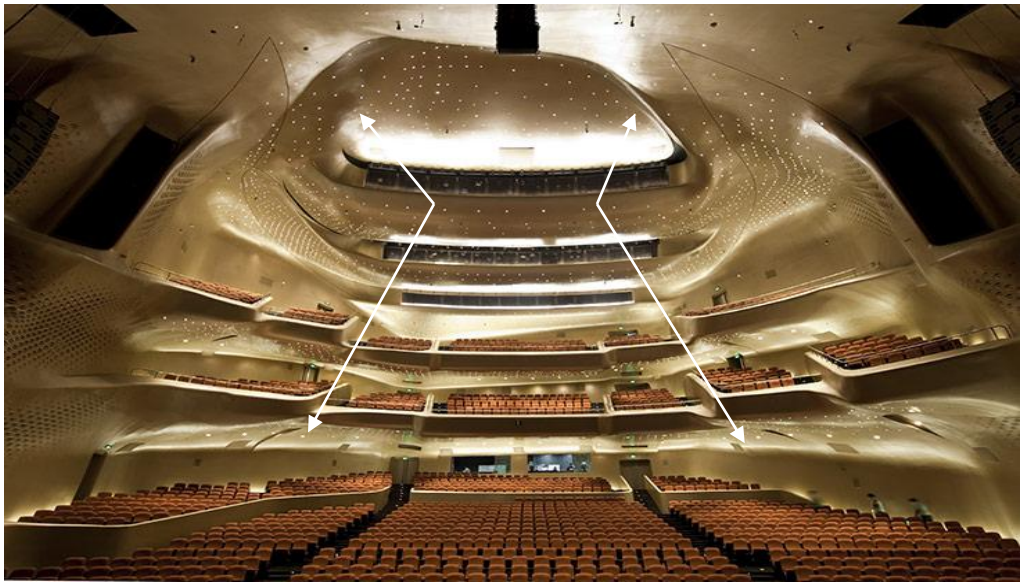


Figure 50. Guangzhou opera house. Case 7 (URL 51)

Evaluation Criteria	
According to source	**Day lighting:** Figure 51 shows the main concert hall of the Guangzhou opera house it is an enclosed space there for there is no day lighting possibilities.
	Artificial Lighting: As seen in figure 51 the artificial lighting is achieved through small spot lighting fixtures that lights up the main space and adds to the design aesthetics of the space.
Lighting design integration type	**Focal:** Focal points can be observed at the higher end of the interior ceiling.
	Task: Small spot lighting provide the necessary lighting to navigate through the concert hall.
	Ambient: General design, spot lighting and color of the interior space bring forward the ambience.
	Accent: reflective materials and accent spots are used.
Methods of lighting	**Down lighting:** extensively used method of lighting.
	Up lighting: there are some spots that are giving up lighting features.
	Wall washing: Wall washing can be perceived in almost all areas of the interior with spots accenting the wall boundaries.

The deconstructivist character of the building

The is the grand concert hall in the Guangzhou opera house as seen in figure 49 the interior is of huge scale with an extensive deconstructive and organic atmosphere. The lighting design and solution within this space can be seen as various spots that cover most of the ceiling of this interior. The reflective qualities of the ceiling and the color are brought forward by the lighting design that is present within this space the clarity of the hall is dimmed down when concerts are being held. There are mixtures of lighting effects that have been used within this interior, combining most of the methods to create an outstanding, dynamic, energetic, and complimentary ambience to this grand hall.

Example 2: Zaha Hadid, Guangzhou opera house

Evaluation Criteria	
According to source	**Day lighting:** Figure 52 shows an enclosed space with no day lighting features. Totally supported by artificial lighting.
	Artificial Lighting: Artificial lighting is mainly used within this space as accent lighting for the design elements of the walls in the space seen in figure 52.
Lighting design integration type	**Focal:** No focal lighting used.
	Task: No form of task lighting used.
	Ambient: Ambience is achieved through the striped lighting features.
	Accent: Accent lighting is repeatedly used for the general design of the space.
Methods of lighting	**Down lighting:** Mixture.
	Up lighting: Mixture.
	Wall washing: Filled with wall accents and wall washes with extensive artificial lighting.

The deconstructivist character of the building

Figure 50 shows a gathering area within the opera house as seen in the visual example it is an enclosed space, therefore artificial lighting has been used. The actual design goes hand in hand with the lighting solution that is presented within this space. Accents of lights have been used to create the desired effect of the ceiling and walls the interesting point within this design is that the walls and ceiling re not spate plane elements they are linked in an organic style the lighting brings forward this organic type of deconstructive style. The relationship between the design and the lighting can be seen within figure 50; it goes hand in hand with the design.

Figure 51. Guangzhou opera house. Case 7 (URL 52)

Example 3: Zaha Hadid, Guangzhou opera house

Evaluation Criteria	
According to source	**Day lighting:** Figure 53 shows a different angle of the Guangzhou opera house; as explained above the interior is closed meaning there is no day lighting that penetrate.
	Artificial Lighting: An array of artificial lighting fixtures has been used in the form of spot lighting that is seen in figure 53. It is the main source of lighting.
Lighting design integration type	**Focal:** Large spots create the focal lighting of this space.
	Task: Small spots create the task lighting needed to navigate.
	Ambient: Extensive use of spot lighting creates the ambience of this space.
	Accent: Spots create accents on the walls of this interior.
Methods of lighting	**Down lighting:** Mixture of both.
	Up lighting: Mixture of both.
	Wall washing: The lighting and reflective surfaces of the walls create a significant wall wash with accents.
The deconstructivist character of the building	
Figure 51 shows figure 49 in at an different angle, showing more of the spot lighting that has been used the general style of the lighting and the characteristics of the design of this building has a strong relationship and connection. The two cannot be separated due to this reason the lighting is clearly part of the design both aesthetical and functional in its own means. Solutions follow the functions of the space when it comes to lighting, not separating the two as different elements but making the lighting the part of the deconstructive style gives the upper hand in visual aesthetics of a space.	

Figure 52. Guangzhou opera house. Case 7 (URL 53)

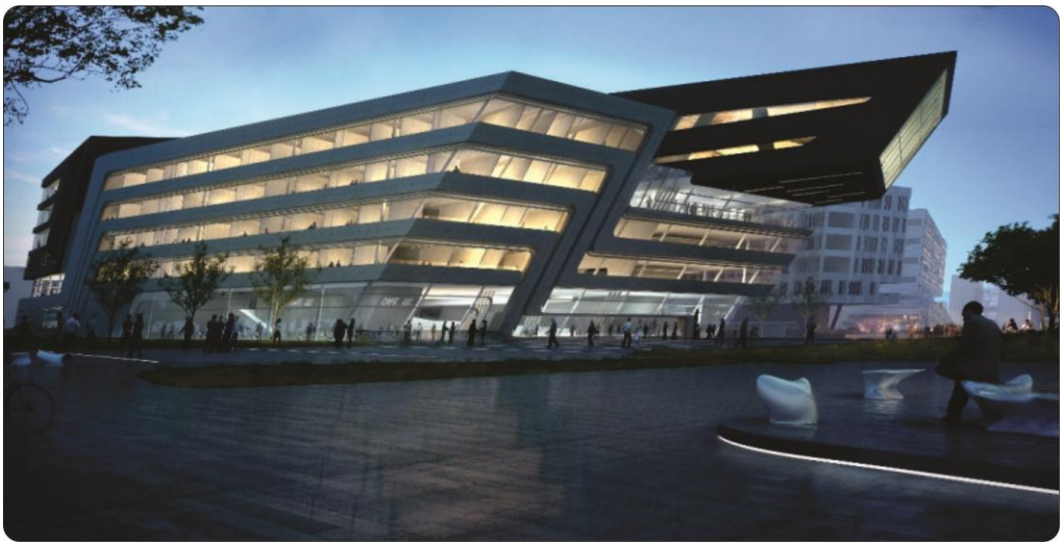
Example 4: Zaha Hadid, Guangzhou opera house

Evaluation Criteria	
According to source	**Day lighting:** The main structural surface of the exterior façade is design to allow extensive natural lighting to penetrate the space; represented in figure 54.
	Artificial Lighting: Artificial lighting is used during night time hours some of the fixtures can be seen in figure 54 as pointed out by circles.
Lighting design integration type	**Focal:** There is no focal lighting.
	Task: There is no task lighting.
	Ambient: Ambience is achieved through the day lighting and exterior façade.
	Accent: Accents come from the shadows brought from the exterior façade.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: Wall washing can be perceived through the shadows from the natural lighting that penetrates the exterior façade.
The deconstructivist character of the building	
The entrance hall to the opera house seen during day time hours with the glass exterior providing a difference from enclosed spaces allowing natural light to fill the interior. The abstract design and textural exterior facades brings forward the natural light that enters this design is similar to the Seattle library. The entrance hall is brightly lit and differs in the design to create dynamics of space in between the concert hall and entrance areas. This calls for contrast in light levels and the types of lights that are used for each type of area. The main attraction of this building when considering natural lighting is the thought for the lighting to be hand in hand with the actual design of the space bringing together the two to create an aesthetical beauty.	

Figure 53. Guangzhou opera house. Case 7 (URL 54)

Architect: Zaha Hadid

Name of Building: library and learning center



Year: 2012

Location: Vienna, Austria

Project Information:

This building is a series of several buildings that make the new campus. The main attractive point within this design is the identifiable design component that features a large black volume that covers most parts of the roofing. Cantilevers that extend out to the public areas and the main entrance. The main interior holds functions such as a main library, cafes, multipurpose activity rooms, lecture rooms, auditorium, work spaces and offices. Curved concrete formations allow for this design to have a smooth organic feel to it.

Figure 54: library and learning center. Case 8 (URL 55)

Example 1: Zaha Hadid, library and learning center

Evaluation Criteria	
According to source	**Day lighting:** The day lighting of this space is achieved from the sky lighting openings that can be seen In figure 56. It is one of the main sources of lighting during day time hours.
	Artificial Lighting: Artificial fixtures can be perceived in figure 56 on the ceiling of the space as stripes. The artificial lighting is engage when day lighting is not possible.
Lighting design integration type	**Focal:** Focal lighting is in the form of stripes of day light creating circulation within the interior.
	Task: General lighting has been used no task lighting can be observed.
	Ambient: The ambience is achieved from the mixture of day lighting and artificial lighting.
	Accent: Accents are reflected off of the interior flooring from the sky light opening.
Methods of lighting	**Down lighting:** extensively used method of lighting.
	Up lighting: there is no up lighting that could be observed.
	Wall washing: The accent on the floor from the natural light that penetrates creates a floor wash of lighting that creates the circulation.
The deconstructivist character of the building	
The main gathering hall of the learning center can be seen in figure 54, this space acts as a navigation point for the other areas of the learning center, the interior is brightly lit with an even distribution of natural and artificial lighting as seen in other examples the lighting elements are stripes of light within the ceiling as openings for sky lighting and other artificial lighting is hidden within the ceiling area of this design.	

Figure 55. Library and learning center. Case 8 (URL 56)

Example 2: Zaha Hadid, library and learning center

Evaluation Criteria	
According to source	**Day lighting:** Figure 57 shows a better visual example of the sky lighting feature of the space these openings provide a good amount of natural lighting.
	Artificial Lighting: The artificial lighting is achieve through the sky lighting apertures it contains striped lighting fixtures within the structural element seen in figure 57.
Lighting design integration type	**Focal:** Sky lighting openings used for focal lighting, main source of lighting.
	Task: The main sky lighting openings light the main space. Creating clear and brightly lit interior.
	Ambient: Ambience is achieved through the day lighting and sky light opening that creates accenting patterns.
	Accent: Accents from sky lighting can be perceived from shadows reflecting.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There is no up lighting that could be observed.
	Wall washing: As seen in the previous example the natural lighting features reflect off the flooring to gain a wash of lighting.
The deconstructivist character of the building	
This is another view of the same interior from a different angle the sky light opening can be seen more clearly notice how the excessive use of natural lighting is common within deconstructive building, another point to note is the sky lighting is linked to the exterior wall of this building allow as much natural light into the interior as possible to get clear and bright results. As seen in most of the case studies the common design element that is used is a striped like lighting patter which follows most of the interior and can be seen in this example.	

Figure 56. Library and learning center, Case 8 (URL 55)

Example 3: Zaha Hadid, library and learning center

Evaluation Criteria	
According to source	**Day lighting:** The day lighting of this space is achieve by the horizontal window opening that lights up the main space and serves as a general aesthetic of the space.
	Artificial Lighting: The artificial lighting can be observed through the same striped lighting fixtures that act as task and focal lighting of the interior space seen in figure 58.
Lighting design integration type	**Focal:** The focal lighting comes in the form of striped lighting fixtures.
	Task: Strips of light illuminate the task oriented spaces.
	Ambient: Mixture of both sources of light and the general design and color create the ambience within the space.
	Accent: Striped ceiling fixtures add to the accenting features of the space.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There are no up lighting that could be observed.
	Wall washing: No wall washing that could be observed.
The deconstructivist character of the building	
This area of the interior is the computer lab and reading activity area accent lighting have been used as a task lighting for the reading and activity areas as seen in figure56 there is a mixture of natural and artificial lighting mostly white lamp sources making it clear and bright for reading and working activities. The color of the flooring material and the white bright lights characterizes the hip and modern aesthetical values the lighting follows more of a function role within this interior.	

Figure 57. Library and learning center. Case 8 (URL 55)

Example 4: Zaha Hadid, library and learning center

Evaluation Criteria	
According to source	**Day lighting:** Figure 59 represents the sky lighting opening seen with the reflectance of natural lighting on the flooring of the interior. Natural lighting is the main source of lighting that is used also for the circulation pattern of the space.
	Artificial Lighting: The artificial lighting cannot be observed within this visual example.
Lighting design integration type	**Focal:** Sky lighting openings used for focal lighting, main source of lighting.
	Task: Sky lighting serves as a circulation pattern from reflecting of off the flooring.
	Ambient: Sky lighting and day light color change could create dynamic effects within this space.
	Accent: Accents can be observed from the striped reflecting natural light from the ceiling.
Methods of lighting	**Down lighting:** Extensively used method of lighting.
	Up lighting: There are no up lighting that could be observed.
	Wall washing: As seen in figure 57 the lighting reflected of the floor, creates wall washes throughout the interior.
The deconstructivist character of the building	
Figure 57 shows the interior from ground level it also represents the natural lighting that reflects of the ground coming from the skylight exterior openings. As seen in this figure the light acts as a circulation pattern showing direction off of the reflective floors. Due to this interior space being more public orientated the lighting is brighter than usual. The design of this building is complimented by the General lighting design solutions that are presented with there for making this design compatible with its lighting solutions.	

Figure 58. Library and learning center. Case 8 (URL 55)

3.2.1 Results of Investigations

The analysis of the case studies identifies the similarities and differences between different types of deconstructive buildings. Each example varied in design. This brought forward the different lighting solutions that are present within these buildings. The aim of this thesis was to understand how the lighting played a role as a design element and weather natural lighting or artificial lighting was balanced according to the interior. From the results that were gain from the analysis, different interiors held different results when it came to lighting solution, moreover the point that was common in between them were that the spaces that hosted public activity areas were held dominance in natural lighting, whereas smaller navigational purposed spaces used a dominance of artificial lighting. The variation of the spaces in each example held their own lighting solution, the most common element that were used when it came down to artificial lighting is the use of accent lighting, which acted as a design element that adds to the aesthetical purpose and general lighting when it came down to the actual function and significance of the lighting element.

The results from the examination have been represented in a table that brings all of the examples together to show how each case study solved the lighting issues the balance in between natural and artificial lighting, and if the lighting was in relationship with the deconstructive style of design. Some of the examples integrated the lighting elements as design elements that brought the whole space together. On the other hand some examples disregarded lighting solutions as a part of the design and used singular fixtures to provide lighting. One of the main aims and objectives of this thesis will be illustrated in the table below:

Table 1: Analysis Table of Results

Analysis table of results	**Lighting dominance**			Lighting solutions in synchronization with general design	
	Natural	**Artificial**	**Balanced**	**yes**	**no**
Coop Himmelblau					
1.Martain Luther church					
2.Busan Cinema center					
Daniel Lebiskind					
3.The run run shaw					
4.crystal at city center					
Rem Koolhaas					
5.seattle central library					
6.casa de musica					
Zaha Hadid					
7.guangzhou opera house					
8.library and learning center					

The results from the table above show the different variations in what types of lighting sources were dominant in each interior and if the lighting solutions complimented the general design of the buildings that were analyzed. The results show that every building except one (Crystal at city center) has their lighting solution to compliment and be part of the general design idea of the buildings rather than being implemented as a secondary fixture. Furthermore we see that the dominance in the types of light sources that were used varies according to the function of the spaces, only two of the designs rely heavily on natural light sources whereas most are balanced or totally controlled by artificial lighting. The main observation that was derived from the results were that within deconstructive building's lighting is the

integration that plays an important role in keeping the character and aesthetics of spaces to harmonies with each other, rather than secondary installments of lighting fixtures.

Chapter 4

CONCLUSION

The evaluation and the analysis of the examples, brings to light some of the questions that were pointed out within the aim and objectives of this thesis. The results from the case studies signify the approach towards lighting within complex designed deconstructive buildings and their spaces. It is present through the observations that deconstructivist buildings consider that lighting has an aesthetical value. In addition it also is used in a way that aesthetics and purpose go hand in hand to create functional interior spaces with the activity that will take place, external lighting fixtures that are not part of the design act as supplements to richen the functionality of the space giving artificial lighting has more control over light levels that are adequate for the spaces.

Furthermore if the lighting is not planned during the process of designing, deconstructive style spaces face even harder lighting solutions due to their irregular patterns and randomly generated angles. Through the examples and observations that were made lighting fixtures that seem to be implemented after finalization of buildings, lack in the true nature of bringing the whole design together as one piece. Therefore the place of lighting within the creation of complex designs such as deconstrctivism plays a significant role in the characteristics, aesthetics and the beauty of the end product. The conclusive remark that this thesis is intended for will be to raise an understanding of the methods of lighting and the resultant effects when

considering complex designs; solutions must be within the process of initial design stages of the building itself.

Future recommendation

This thesis could provide an interior designer/ architect or researcher that is involved within the subjects of complex designs and lighting solutions that follow the general design principles of the project. This thesis can be used as a reference for further studies. Furthermore the analysis and evaluation methods could benefit other researchers as to how and what types of lighting observation and criteria modules could be used in the assessment of lighting when considering deconstructive style interiors.

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